Graduate Curriculum Committee

Minutes

September 12, 2024
Meeting Materials

Voting Conducted
via Zoom

I. Presentation and review of the Minutes from the June Meeting of the Graduate Curriculum Committee (GCC).

II. Update(s) to the Committee: The following was reviewed by the Graduate Curriculum Committee (GCC) previously. The GCC felt further follow-up and/or clarifications were necessary before the proposals could move forward to the University Curriculum Committee (UCC). Suggestions and/or follow-up required are noted below the proposals.

COP – Medicinal Chemistry

1. PHA 6XXX *Advanced Applications in DNA*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19590

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

2. PHA 6XXX *Applied Statistics for Laboratory Data Analysis*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19609

   The proposal has been conditionally approved. Once revised, the GCC wishes to review the proposal again.

HHP – Sport Management

3. SPM 5XXX *Diversity, Equity, and Inclusion in Sport Organizations*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/18878

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

III. Course Change Proposals: The following proposals are newly requested revisions to existing courses already within the current course catalog in the curriculum inventory. The changes requested are listed below each of the proposals.

MED –Health Outcomes and Biomedical Informatics

1. GMS 6848 *Ensuring Rigor and Reproducibility in Clinical and Translational Research*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20224

The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

COP – Pharmacotherapy and Translational Research

2. PHA 6746 *Patient Education and Communication in the Era of Precision Medicine*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20102

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

IV. New 5XXX Course Proposal(s) (with attached syllabi): The following are newly requested course proposals. Proposed course titles and descriptions are listed below. Syllabi have been included with these new course requests, at the request of GCC Members.

DCP – Architecture

1. ARC 5XXX *Integrated Building Tech 1*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20297

   The proposal has been conditionally approved. Once revised, the GCC wishes to review the proposal again.

2. ARC 5XXX *Integrated Building Tech 2*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20298

   The proposal has been conditionally approved. Once revised, the GCC wishes to review the proposal again.

3. ARC 5XXX *Integrated Building Tech 3*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20299

   The proposal has been conditionally approved. Once revised, the GCC wishes to review the proposal again.

4. ARC 5XXX *Integrated Building Tech 4*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20300

   The proposal has been conditionally approved. Once revised, the GCC wishes to review the proposal again.

5. ARC 5XXXL *Graduate Core Studio 3*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20030

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

6. ARC 5XXXL *Graduate Core Studio 4*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20031

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

v. New Course Proposal(s) (with attached syllabi): The following are newly requested course proposals. Proposed course titles and descriptions are listed below. Syllabi have been included with these new course requests, at the request of GCC Members.

CALS – Entomology and Nematology

1. ENY 6XXX *Global Change and Insect Declines*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19841

   The proposal has been conditionally approved. Once revised, the GCC wishes to review the proposal again.

MED – Neuroscience

2. GMS 6XXX *Aging and the Brain*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19869

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

3. GMS 6XXX *Neuroimaging*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19862

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

4. GMS 6XXX *Neuroscience Professional Survival Skills*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/19861

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

COP – Medicinal Chemistry

5. PHA 6XXX *Drug Development Strategies*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20131

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved without further review by the GCC.

COP – Pharmaceutics

6. PHA 6XXX *Personal Genomics and Your Health*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20226

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

PHHP – Environmental and Global Health

7. PHC 6XXX *Artificial Intelligence in Environmental and Global Health*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20140

   The proposal has been conditionally approved. Once revised, the proposal can be administratively approved after further review by the Chair of the GCC.

CLAS – Sociology

8. SYA 7XXX *Sociological Application of Network Science*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/18946

   The proposal has been conditionally approved. Once revised, the GCC wishes to review the proposal again.

VI. Information Items:

1. ABE 6933 – 20008 – Change maximum repeatable credit from 6 to 15
2. BME 6938 – 20116 – Change maximum repeatable credit from 6 to 18
3. CAP 5771 – 20079 – Share course ownership
4. CCJ 5934 – 19761 – Change maximum repeatable credit from 12 to 36
5. CGN 6905 – 20074 – Change maximum repeatable credit from 10 to 18
6. EAS 6939 – 20088 – Change course description and maximum repeatable credit from 12 to 15
7. ECH 6937 – 20109 – Change maximum repeatable credit from 9 to 12

8. EEC 6933 – 20097 – Change maximum repeatable credit from 12 to 18
9. EEL 5934 – 20108 – Change maximum repeatable credit from 8 to 18
10. EEX 6936 – 20092 – Change maximum repeatable credit from 12 to 18
11. EGM 6934 – 20089 – Change maximum repeatable credit from 12 to 15
12. EML 6934 – 20091 – Change maximum repeatable credit from 12 to 15
13. ENV 6932 – 20072 – Change maximum repeatable credit from 8 to 18
14. EOC 6934 – 20075 – Change maximum repeatable credit from 9 to 18
15. GMS 6007 – 20107 – Change prerequisites
16. GMS 6750 – 20084 – Change prerequisites
17. GMS 6852 – 20221 – Change to course title
18. GMS 6853 – 20222 – Change to course title
19. PHA 6935 – 19849 – Change maximum repeatable credit from 12 to 18
20. PHC 6905 – 20220 – Share course ownership
21. SPS 6937 – 20094 – Change maximum repeatable credit from 12 to 18
22. SPS 7979 – 20095 – Change maximum repeatable credit from 12 to 99
23. SPS 7980 – 20096 – Change maximum repeatable credit from 15 to 99
24. VME 6937L – 19872 – Change maximum repeatable credit from 2 to 6

Graduate Curriculum Committee

Agenda

October 10, 2024
Meeting Materials

Voting Conducted
via Zoom

I. Presentation and review of the Minutes from the September Meeting of the Graduate Curriculum Committee (GCC).

II. Update(s) to the Committee: The following was reviewed by the Graduate Curriculum Committee (GCC) previously. The GCC felt further follow-up and/or clarifications were necessary before the proposals could move forward to the University Curriculum Committee (UCC). Suggestions and/or follow-up required are noted below the proposals.

There are no updates to present at this time.

III. Course Change Proposals: The following proposals are newly requested revisions to existing courses already within the current course catalog in curriculum inventory. The changes requested are listed below each of the proposals.

There are no modifications to present at this time.

IV. New 5XXX Course Proposal(s) (with attached syllabi): The following are newly requested course proposals. Proposed course titles and descriptions are listed below. Syllabi have been included with these new course requests, at the request of GCC Members.

There are no 5XXX courses to present at this time.

V. New Course Proposal(s) (with attached syllabi): The following are newly requested course proposals. Proposed course titles and descriptions are listed below. Syllabi have been included with these new course requests, at the request of GCC Members.

MED – Pharmacology and Therapeutics

1. GMS 6XXX *AI Experimental Design in Pharmacology*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20575

   We will explore the transformative intersection of Artificial Intelligence (AI) and experimental design. We will delve into how AI can revolutionize scientific research by optimizing experimental workflows, selecting the most informative experiments, and accelerating scientific discovery. The course will cover machine learning techniques for data analysis, active learning for experiment selection, and reinforcement learning for optimizing complex experimental procedures.

2. GMS 6XXX *AI-Powered Discovery of Biological Therapeutics*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20572

   We will explore the transformative potential of Artificial Intelligence (AI) in discovering novel biological therapeutics. We will delve into machine learning and deep learning techniques for analyzing biological data, predicting protein function, and designing targeted biotherapeutics. Additionally, the course will address the integration of AI with high-throughput screening methods and explore the regulatory landscape for AI-derived therapies.

3. GMS 6XXX *AI-Powered Prediction of Drug Outcomes*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20574

   We will explore the application of Artificial Intelligence (AI) in predicting patient outcomes for improved clinical decision-making and personalized medicine. We will delve into machine learning and deep learning techniques for analyzing electronic health records (EHRs) and other clinical data to predict disease progression, risk of complications, and response to treatment. Additionally, the course will address ethical considerations, explainability of models, and the challenges of integrating

4. GMS 6XXX *AI-Powered Small Molecule Discovery*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20573

   We will explore the cutting-edge application of Artificial Intelligence (AI) in discovering novel small molecules for drug development. We will delve into the fundamental principles of machine learning and deep learning techniques used for virtual screening, lead optimization, and de novo molecule design. The course will also address the integration of biological data with AI models and explore the practical challenges and limitations of this approach.

5. GMS 6XXX *Fundamentals of Biomedical AI*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20571

   We will provide a comprehensive introduction to the field of Artificial Intelligence (AI). It explores the fundamental concepts, historical development, and various applications of AI. We will delve into core machine learning techniques and explore subfields like natural language processing and computer vision. Ethical considerations, societal impact, and future directions of AI research will also be addressed.

6. GMS 6XXX *Independent Study in AI and Drug Discovery*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20576

   The independent study explores the application of Artificial Intelligence (AI) in drug discovery. You will delve into machine learning and deep learning techniques used for

various stages of the drug discovery pipeline, from virtual screening to lead optimization. Additionally, you will explore the integration of biological data with AI models and critically analyze the current limitations and future directions of this field.

COP – Medicinal Chemistry

7. PHA 6XXX *AI for Drug Discovery*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20549

   This course is designed to provide a comprehensive understanding of the integration of artificial intelligence (AI) in drug discovery. It covers cheminformatics, machine learning, deep learning, and their applications for small molecule and biologics drug design and discovery. Students will gain both a general understanding and hands-on experience of AI applications in drug discovery.

PHHP – Public Health

8. PHC 6XXX *Public Health Methods II: Applying Qualitative & Mixed Methods for Assessment*
   Link to proposal: https://secure.aa.ufl.edu/Approval/reports/20422

   This is the second of two courses that focus on public health/global health research and practice using both quantitative and qualitative methods. This course will introduce qualitative and mixed methods and their relevance to rigorous public health research and practice, with an emphasis on using qualitative methods to conduct needs and capacity assessments within communities and organizations.

VI. Information Items:

1. EDF 6400 – 20227 – Change prerequisites
2. EDF 6403 – 20228 – Change prerequisites
3. EDF 6468 – 20184 – Change prerequisites
4. EDF 6471 – 20230 – Change prerequisites
5. EDF 6492 – 20185 – Change prerequisites
6. EDF 7405 – 20229 – Change prerequisites
7. EDG 6931 – 20316 – Change maximum repeatable credit from 12 to 18
8. MHS 6020 – 20163 – Change prerequisites
9. MHS 6495 – 20176 – Change prerequisites
10. MHS 7730 – 20359 – Change prerequisites
11. MHS 7804 – 20167 – Change co-requisites
12. MHS 7805 – 20168 – Change co-requisites

13. MHS 7806 – 20170 – Change co-requisites
14. MHS 7807 – 20171 – Change co-requisites
15. PHA 6279 – 20476 – Change maximum repeatable credit from 3 to 6
16. SDS 6436 – 20172 – Change co-requisites
17. SDS 7800 – 20175 – Change co-requisites and prerequisites
18. SDS 7820 – 20173 – Change co-requisites
19. SDS 7830 – 20174 – Change co-requisites
20. URP 6941 – 19964 – Change to course title and description

Course|New for request 20575

Info

Request: GMS 6XXX AI Experimental Design in Pharmacology
Description of request: This course explores the transformative intersection of Artificial Intelligence (AI) and experimental design. We will delve into how AI can revolutionize scientific research by optimizing experimental workflows, selecting the most informative experiments, and accelerating scientific discovery. The course will cover machine learning techniques for data analysis, active learning for experiment selection, and reinforcement learning for optimizing complex experimental procedures. Additionally, ethical considerations, explainability of AI models, and the integration of AI with existing experimental design principles will be addressed.

It will be included in a new online master's degree program in AI and Drug Discovery.

There is no significant overlap with existing courses. CAI 5720 and CAI 5721 focus on the general usage of AI in medicine, both clinical and experimental, and are only taught in-person. CAI 5733 focuses on AI in drug discovery but it is more of a superficial overview of topics included in multiple courses that are being submitted for approval and it is also only taught in-person. PHA 6241 addresses AI in pharmacy but is much more focused on clinical aspects rather than drug discovery.

Submitter: Stephan Jahn scjahn@ufl.edu
Created: 9/23/2024 10:38:18 AM
Form version: 1

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
GMS

Course Level
*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.). *
* *

Response:
6

- *1 = 1000 level Introductory undergraduate*
- *2 = 2000 level Introductory undergraduate*
- *3 = 3000 level Intermediate undergraduate*
- *4 = 4000 level Advanced undergraduate*
- *5 = 5000 level Introductory graduate/professional*
- *6 = 6000 level Intermediate graduate/professional*
- *7 = 7000 level Advanced graduate/professional*
- *8 = 8000 level Advanced professional*
- *4/5 = 4000/5000 Joint undergraduate/graduate*
- *4/6 = 4000/6000 Joint undergraduate/graduate*

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Committee) and require separate requests to each body*

Course Number
Enter the three-digit number indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this should be XXX until SCNS assigns an appropriate number.

Response:
XXX

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100-character limit (including spaces and punctuation) for course titles. *

Response:
AI Experimental Design in Pharmacology

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
AI Pharmacology Experiments

Delivery Method
Indicate the primary intended delivery method for this course.

Response:
AD - All Distance Learning (100% of course content taught outside of classroom)

If the course is to be offered through UF Online, please include a memo of support from the UF Online program.

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year
Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic
Select “Yes” if the course routinely has varying course titles, topics, and student learning outcomes within or between semesters. Small changes to weekly topics and or texts that do not change the course description or student learning outcomes do not need to have rotating topics designation.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion. Note that credit hours are regulated by Rule 6A-10.033, FAC. If the course will be offered with variable credit, select "Variable" and then indicate the minimum and maximum credits per section. Additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
3

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission. If S/U only, please remember that the syllabus must include a grading rubric that clearly indicates how students will earn S or U grades.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:

Regularly Scheduled

• Regularly Scheduled [base hr]
• Thesis/Dissertation Supervision [1.0 headcount hr]
• Clinical Instruction [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Course Type
*Please select the type of course being created. These categories are required by the Florida Board of Governors. *

Response:
Lecture

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course. If weekly contact hours are not 1:1 for credits (e.g. 4 contact hours per week for a 2 credit course), please explain why.

Response:
3

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 500 characters or less. See course description guidelines. Please do not start the description with "This course.."

Response:
We will explore the transformative intersection of Artificial Intelligence (AI) and experimental design. We will delve into how AI can revolutionize scientific research by optimizing experimental workflows, selecting the most informative experiments, and accelerating scientific discovery. The course will cover machine learning techniques for data analysis, active learning for experiment selection, and reinforcement learning for optimizing complex experimental procedures.

Prerequisites
*Indicate all requirements that must be satisfied prior to enrollment in the course, or enter N/A if there are none. “Permission of department” is always an option so it should not be included in any prerequisite or co-requisite. *
*Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be written so that it can be enforced in the registration system. *
Undergraduate courses level 3000 and above must have a prerequisite.
Please verify that any prerequisite courses listed are active courses.

Response:
n/a

Completing Prerequisites:

• Use “&” and “or” to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• If the course prerequisite should list a specific major and/or minor, please provide the plan code for that major/minor (e.g., undergraduate Chemistry major = CHY_BS, undergraduate Disabilities in Society minor = DIS_UMN)

*Example: *
<ol>
• Prereq published language: BSC 2010/2010L & BSC 2011/2011L & two additional Science or Math classes.
*• Prereq logic enforced for registration: BSC 2010 and BSC 2010L and BSC 2011 and BSC 2011L and (two additional Science or Math courses = any courses that are BSC 2### or greater, FAS2### or greater, BOT2### or greater, PCB2### or greater, BCH2### or greater, ZOO2### or greater, MCB 2### or greater, CHM 2### or greater, PHY 2### or greater, or STA 2### or greater).
*

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
n/a

Rationale for Placement in the Curriculum
Please indicate the degree level (Bachelors, Graduate, Professional) and program(s) (majors, minors, certificates) for which the course will be used. Please indicate if the course is intended for degree requirements or electives. Note: separate program-specific request are required to add a course into program curriculua.

Response:
This course will be included in a new online master's degree program in Artificial Intelligence and Drug Design. It will provide an introduction to basic AI principles, how AI relates to biomedical research, and particularly drug design.

Syllabus Content Requirements
<h2>Syllabus Content Requirements</h2>Please upload the syllabus for the proposed course. (Note that rotating topics courses should still submit a sample syllabus to illustrate the kind of content that will be included.) Before uploading, ensure that the syllabus contains:

• Student learning outcomes explaining what students will be able to do after successfully completing the course. These should use observable, measurable action verbs.
• Required and recommended readings for the course.
• Name of instructor(s) or planned instructor(s). If unknown, list as TBD.
• Materials and Supplies fees, if any.
• Methods by which students will be graded
• The grading scheme used in the course (e.g., what constitutes an A, an A-, etc.), along with information on current UF grading policies for assigning grade points. This may be achieved by including a link to the university grades and grading policies.
• A 15 week calendar or schedule of topics with enough detail to illustrate weekly topics, readings, and assignments (asynchronous or modular courses can arrange by modules rather than weeks).
• A statement related to class attendance, make-up exams and other work such as: “Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies.”
• A statement related to accommodations for students with disabilities such as: Students with disabilities who

experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
• A statement informing students of the online course evaluation process such as: "Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results."

Response:
All Items Included

UF College of Medicine
Department of Pharmacology and Therapeutics
UNIVERSITY of FLORIDA

GMS 6XXX
AI Experimental Design in Pharmacology

Classroom: Online via http://elearning.ufl.edu

Course Director and Program Coordinator:
Stephan C. Jahn, Ph.D. Phone: 352-294-5543 E-mail: scjahn@ufl.edu

There are no set office hours for this online course, to best accommodate asynchronous learning. If you have questions about the material or the course, please contact one of the above individuals using E-Learning.

COURSE DESCRIPTION

This course explores the transformative intersection of Artificial Intelligence (AI) and experimental design. We will delve into how AI can revolutionize scientific research by optimizing experimental workflows, selecting the most informative experiments, and accelerating scientific discovery. The course will cover machine learning techniques for data analysis, active learning for experiment selection, and reinforcement learning for optimizing complex experimental procedures. Additionally, ethical considerations, explainability of AI models, and the integration of AI with existing experimental design principles will be addressed.

PREREQUISITES

This course requires a BA or BS and basic skills in computer programming (Python preferred).

LEARNING RESOURCES

1. Recorded video lectures with PowerPoint presentations will be provided in E-Learning.

2. Lecture notes for each video lecture are available as PDF downloads in E-Learning.

3. While not required, recommended texts to accompany the online content are:

Artificial Intelligence: A Modern Approach by Russel and Norvig, ISBN 0134610997

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems by Geron, ISBN 1492032646

LEARNING OUTCOMES

1. Understand the key concepts and algorithms for using AI in experimental design.
2. Apply machine learning techniques for analyzing data generated from scientific experiments.
3. Explore active learning strategies to select the most informative experiments for maximizing knowledge gain.
4. Utilize reinforcement learning algorithms to optimize complex experimental workflows and procedures.
5. Analyze the ethical considerations and limitations of using AI for experimental design.

6. Evaluate the explainability of AI models and their recommendations for experimental design.

7. Develop skills for integrating AI tools with traditional experimental design principles.

8. Design and propose AI-powered experimental strategies for a specific research question.

GRADING SCALE

A numerical grade will be given at the end of the course and will be scored as follows, per University of Florida standards (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx):

92-100% = A
90-91% = A-
87-89% = B+
82-86% = B
80-81% = B-
77-79% = C+
72-76% = C
70-71% = C-
67-69% = D+
62-66% = D
60-61% = D-
<60% = E

FINAL GRADE CALCULATION

Your final grade will be calculated as below:
30% Homework
25% Midterm Exam
45% Final Project

1. **Homework: 30%**

   a. There will be periodic homework assignments throughout the semester.
   b. These will consist of
      1. Problem sets including multiple choice, matching, and similar questions.
      2. Programming exercises

2. **Midterm Exam: 25%**

   a. There will be one exam near the midpoint of the semester.
   b. It will cover all material from the first half of the semester.
   c. The exam will contain questions in the same form as the problem sets

3. **Final Project: 45%**

   a. There will be one project due near the end of the semester.
   b. It will require students to apply AI principles and skills to a specific problem relevant to the course.

EXAM PROCTORING

The exam will be monitored by ProctorU, a UF chosen service that allows the students to complete their exams at home while still ensuring academic integrity. Students will make the arrangements for exam proctoring. But all standard costs of the exam are covered in the registration costs. Last-minute appointments with ProctorU to

take the exam may incur extra costs that are the responsibility of the student.

ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however, you will need to schedule your proctoring session at least 72 hours in advance to avoid any on-demand scheduling fees. Creating a ProctorU account is simple. You can do so by visiting go.proctoru.com.

In order to use ProctorU, you will need a high-speed internet connection, a webcam (internal or external), a windows or apple operating system, and a government issued photo id. ProctorU recommends that you visit https://test-it-out.proctoru.com/ prior to your proctoring session to test your equipment. We recommend you click on the button that says "connect to a live person" to fully test out your equipment.

Additionally, please visit and review the test-taker resource center here. You should expect the startup process with the proctor to take about 10-15 minutes. However, this time will not affect your exam time. Please feel free to direct any questions to the student support team via the live chat within your account.

MAKE-UP AND LATE POLICY

There are no make-up exams allowed unless otherwise granted by the course coordinator prior to an examination date. Failure to take an exam without prior permission from the course coordinator will be recorded as 0.

All other assignments may be completed late up until final grades are posted. A penalty of 0.2% per hour will be applied to each late assignment unless due to an excused absence, as defined by UF policy https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/. At no point shall an assignment be worth less than 50% of its original value. In the event of an excused absence, the student must work with the instructor to turn in work as soon as feasible.

ACADEMIC HONESTY

Please review the complete policy of the University of Florida regarding academic dishonesty, found in the online student handbook at: http://graduateschool.ufl.edu/media/graduate-school/pdf-files/handbook.pdf. Students are expected to abide by the University of Florida Academic Honesty Guidelines and to adhere to the following pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

ACCESSIBILITY

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

IMPORTANT NOTICE ABOUT PLAGIARISM

Plagiarism is not tolerated at the University of Florida. The University of Florida has an honor code that defines plagiarism as follows: Section 3a: Plagiarism. A student shall not represent as the student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

1. Quoting oral or written materials including but not limited to those found on the internet, whether published

or unpublished, without proper attribution.
2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Please note that intent is not an element of this kind of violation so it is important to take great care to complete the written assignments in your own words. The first incidence of plagiarism, which will be reported to the University, may be punishable by a maximum penalty of a "0" grade for the assignment. Subsequently, a second academic honesty infraction can result in expulsion from the University.

For a complete description of the UF Honor Code and procedures, please visit: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/.

For a good discussion about plagiarism and how to properly cite your sources, please visit: http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9 .

COURSE OUTLINE

Due Dates Can Be Found on E-Learning

Videos	Problem Sets (P.S.)/ Assignments
Introduction to AI for Experimental Design	**Literature Review: Current Applications of AI in Scientific Research**
Machine Learning for Scientific Data Analysis: Supervised Learning	**Analyze a scientific dataset using machine learning techniques**
Active Learning for Experiment Selection: Uncertainty Sampling & Bayesian Optimization	**Active Learning for Experiment Selection: Uncertainty Sampling & Bayesian Optimization**
Case Studies: Successful Applications of AI-powered Experimental Design	**Analyze research papers on successful implementations of AI in experimental design**
Reinforcement Learning for Optimizing Experimental Workflows	**Simulate and optimize an experimental workflow using a reinforcement learning model**
Explainability of AI Models in Experimental Design: Understanding Recommendations	**Analyze the explainability of existing AI models used for experimental design**
	Midterm Exam
Ethical Considerations of AI in Scientific Research: Bias & Transparency	**Discuss ethical concerns surrounding AI-driven experiment design**

Integrating AI with Traditional Design of Experiments (DoE)	**Analyze a case study on using AI with traditional DoE methods**
Future Directions: Advancements in AI for Scientific Discovery	**Research and present on a future trend in AI-powered scientific experimentation**
	Final Project

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Course|New for request 20572

Info

Request: GMS 6XXX AI-Powered Discovery of Biological Therapeutics
Description of request: This course explores the transformative potential of Artificial Intelligence (AI) in discovering novel biological therapeutics. We will delve into machine learning and deep learning techniques for analyzing biological data, predicting protein function, and designing targeted biotherapeutics. Additionally, the course will address the integration of AI with high-throughput screening methods and explore the regulatory landscape for AI-derived therapies.

It will be included in a new online master's degree program in AI and Drug Discovery.

There is no significant overlap with existing courses. CAI 5720 and CAI 5721 focus on the general usage of AI in medicine, both clinical and experimental, and are only taught in-person. CAI 5733 focuses on AI in drug discovery but it is more of a superficial overview of topics included in multiple courses that are being submitted for approval and it is also only taught in-person. PHA 6241 addresses AI in pharmacy but is much more focused on clinical aspects rather than drug discovery.

Submitter: Stephan Jahn scjahn@ufl.edu
Created: 9/23/2024 10:21:19 AM
Form version: 1

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
GMS

Course Level
*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.). *
* *

Response:
6

- *1 = 1000 level Introductory undergraduate*
- *2 = 2000 level Introductory undergraduate*
- *3 = 3000 level Intermediate undergraduate*
- *4 = 4000 level Advanced undergraduate*
- *5 = 5000 level Introductory graduate/professional*
- *6 = 6000 level Intermediate graduate/professional*
- *7 = 7000 level Advanced graduate/professional*
- *8 = 8000 level Advanced professional*
- *4/5 = 4000/5000 Joint undergraduate/graduate*
- *4/6 = 4000/6000 Joint undergraduate/graduate*

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Committee) and require separate requests to each body*

Course Number
Enter the three-digit number indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this should be XXX until SCNS assigns an appropriate number.

Response:
XXX

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100-character limit (including spaces and punctuation) for course titles. *

Response:
AI-Powered Discovery of Biological Therapeutics

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
AI Biologic Discovery

Delivery Method
Indicate the primary intended delivery method for this course.

Response:
AD - All Distance Learning (100% of course content taught outside of classroom)

If the course is to be offered through UF Online, please include a memo of support from the UF Online program.

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year

Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic
Select “Yes” if the course routinely has varying course titles, topics, and student learning outcomes within or between semesters. Small changes to weekly topics and or texts that do not change the course description or student learning outcomes do not need to have rotating topics designation.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion. Note that credit hours are regulated by Rule 6A-10.033, FAC. If the course will be offered with variable credit, select "Variable" and then indicate the minimum and maximum credits per section. Additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
3

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission. If S/U only, please remember that the syllabus must include a grading rubric that clearly indicates how students will earn S or U grades.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:
Regularly Scheduled

- *Regularly Scheduled [base hr]*
- *Thesis/Dissertation Supervision [1.0 headcount hr]*

• Clinical Instruction [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Course Type
*Please select the type of course being created. These categories are required by the Florida Board of Governors. *

Response:
Lecture

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course. If weekly contact hours are not 1:1 for credits (e.g. 4 contact hours per week for a 2 credit course), please explain why.

Response:
3

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 500 characters or less. See course description guidelines. Please do not start the description with "This course.."

Response:
We will explore the transformative potential of Artificial Intelligence (AI) in discovering novel biological therapeutics. We will delve into machine learning and deep learning techniques for analyzing biological data, predicting protein function, and designing targeted biotherapeutics. Additionally, the course will address the integration of AI with high-throughput screening methods and explore the regulatory landscape for AI-derived therapies.

Prerequisites
*Indicate all requirements that must be satisfied prior to enrollment in the course, or enter N/A if there are none. “Permission of department” is always an option so it should not be included in any prerequisite or co-requisite. *
*Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be written so that it can be enforced in the registration system. *
Undergraduate courses level 3000 and above must have a prerequisite.
Please verify that any prerequisite courses listed are active courses.

Response:
n/a

Completing Prerequisites:

• Use “&” and “or” to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would

only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• If the course prerequisite should list a specific major and/or minor, please provide the plan code for that major/minor (e.g., undergraduate Chemistry major = CHY_BS, undergraduate Disabilities in Society minor = DIS_UMN)

*Example: *
<ol>
• Prereq published language: BSC 2010/2010L & BSC 2011/2011L & two additional Science or Math classes.
*• Prereq logic enforced for registration: BSC 2010 and BSC 2010L and BSC 2011 and BSC 2011L and (two additional Science or Math courses = any courses that are BSC 2### or greater, FAS2### or greater, BOT2### or greater, PCB2### or greater, BCH2### or greater, ZOO2### or greater, MCB 2### or greater, CHM 2### or greater, PHY 2### or greater, or STA 2### or greater).
*

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
n/a

Rationale for Placement in the Curriculum
Please indicate the degree level (Bachelors, Graduate, Professional) and program(s) (majors, minors, certificates) for which the course will be used. Please indicate if the course is intended for degree requirements or electives. Note: separate program-specific request are required to add a course into program curriculua.

Response:
This course will be included in a new online master's degree program in Artificial Intelligence and Drug Design. It will provide an introduction to basic AI principles, how AI relates to biomedical research, and particularly drug design.

Syllabus Content Requirements
<h2>Syllabus Content Requirements</h2>Please upload the syllabus for the proposed course. (Note that rotating topics courses should still submit a sample syllabus to illustrate the kind of content that will be included.) Before uploading, ensure that the syllabus contains:

• Student learning outcomes explaining what students will be able to do after successfully completing the course. These should use observable, measurable action verbs.
• Required and recommended readings for the course.
• Name of instructor(s) or planned instructor(s). If unknown, list as TBD.
• Materials and Supplies fees, if any.
• Methods by which students will be graded
• The grading scheme used in the course (e.g., what constitutes an A, an A-, etc.), along with information on current UF grading policies for assigning grade points. This may be achieved by including a link to the university grades and grading policies.
• A 15 week calendar or schedule of topics with enough detail to illustrate weekly topics, readings, and assignments (asynchronous or modular courses can arrange by modules rather than weeks).
• A statement related to class attendance, make-up exams and other work such as: “Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies.”
• A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
• A statement informing students of the online course evaluation process such as: “Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course

evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results."

Response:
All Items Included

UF College of Medicine
Department of Pharmacology and Therapeutics
UNIVERSITY of FLORIDA

GMS 6XXX
AI-Powered Discovery of Biological Therapeutics

Classroom: Online via http://elearning.ufl.edu

Course Director and Program Coordinator:
Stephan C. Jahn, Ph.D. Phone: 352-294-5543 E-mail: scjahn@ufl.edu

There are no set office hours for this online course, to best accommodate asynchronous learning. If you have questions about the material or the course, please contact one of the above individuals using E-Learning.

COURSE DESCRIPTION

This course explores the transformative potential of Artificial Intelligence (AI) in discovering novel biological therapeutics. We will delve into machine learning and deep learning techniques for analyzing biological data, predicting protein function, and designing targeted biotherapeutics. Additionally, the course will address the integration of AI with high-throughput screening methods and explore the regulatory landscape for AI-derived therapies.

PREREQUISITES

This course requires a BA or BS and basic skills in computer programming (Python preferred).

LEARNING RESOURCES

1. Recorded video lectures with PowerPoint presentations will be provided in E-Learning.

2. Lecture notes for each video lecture are available as PDF downloads in E-Learning.

3. While not required, recommended texts to accompany the online content are:

Artificial Intelligence: A Modern Approach by Russel and Norvig, ISBN 0134610997

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems by Geron, ISBN 1492032646

LEARNING OUTCOMES

1. Gain a comprehensive understanding of AI methodologies used in biological therapeutics discovery.
2. Analyze the application of machine learning and deep learning for protein structure prediction and function analysis.
3. Explore AI-driven design of antibodies, peptides, and other biotherapeutics.
4. Integrate AI models with high-throughput screening (HTS) for efficient candidate selection.
5. Analyze the regulatory considerations and ethical implications of AI-based biotherapeutics.

6. Develop skills for designing and implementing AI workflows for biological therapeutics discovery.

GRADING SCALE

A numerical grade will be given at the end of the course and will be scored as follows, per University of Florida standards (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx):

92-100% = A
90-91% = A-
87-89% = B+
82-86% = B
80-81% = B-
77-79% = C+
72-76% = C
70-71% = C-
67-69% = D+
62-66% = D
60-61% = D-
<60% = E

FINAL GRADE CALCULATION

Your final grade will be calculated as below:
30% Homework
25% Midterm Exam
45% Final Project

1. **Homework: 30%**

   a. There will be periodic homework assignments throughout the semester.
   b. These will consist of
      1. Problem sets including multiple choice, matching, and similar questions.
      2. Programming exercises

2. **Midterm Exam: 25%**

   a. There will be one exam near the midpoint of the semester.
   b. It will cover all material from the first half of the semester.
   c. The exam will contain questions in the same form as the problem sets

3. **Final Project: 45%**

   a. There will be one project due near the end of the semester.
   b. It will require students to apply AI principles and skills to a specific problem relevant to the course.

EXAM PROCTORING

The exam will be monitored by ProctorU, a UF chosen service that allows the students to complete their exams at home while still ensuring academic integrity. Students will make the arrangements for exam proctoring. But all standard costs of the exam are covered in the registration costs. Last-minute appointments with ProctorU to take the exam may incur extra costs that are the responsibility of the student.

ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however, you will need to schedule your proctoring session at least 72 hours

in advance to avoid any on-demand scheduling fees. Creating a ProctorU account is simple. You can do so by visiting go.proctoru.com.

In order to use ProctorU, you will need a high-speed internet connection, a webcam (internal or external), a windows or apple operating system, and a government issued photo id. ProctorU recommends that you visit https://test-it-out.proctoru.com/ prior to your proctoring session to test your equipment. We recommend you click on the button that says "connect to a live person" to fully test out your equipment.

Additionally, please visit and review the test-taker resource center here. You should expect the startup process with the proctor to take about 10-15 minutes. However, this time will not affect your exam time. Please feel free to direct any questions to the student support team via the live chat within your account.

MAKE-UP AND LATE POLICY

There are no make-up exams allowed unless otherwise granted by the course coordinator prior to an examination date. Failure to take an exam without prior permission from the course coordinator will be recorded as 0.

All other assignments may be completed late up until final grades are posted. A penalty of 0.2% per hour will be applied to each late assignment unless due to an excused absence, as defined by UF policy https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/. At no point shall an assignment be worth less than 50% of its original value. In the event of an excused absence, the student must work with the instructor to turn in work as soon as feasible.

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2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Please note that intent is not an element of this kind of violation so it is important to take great care to complete the written assignments in your own words. The first incidence of plagiarism, which will be reported to the University, may be punishable by a maximum penalty of a "0" grade for the assignment. Subsequently, a second academic honesty infraction can result in expulsion from the University.

For a complete description of the UF Honor Code and procedures, please visit: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/.

For a good discussion about plagiarism and how to properly cite your sources, please visit: http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9 .

COURSE OUTLINE

Due Dates Can Be Found on E-Learning

Videos	Problem Sets (P.S.)/ Assignments
Introduction to AI for Biotherapeutics: Overview & Challenges	**Literature Review: Current Applications of AI in Biotherapeutics Discovery**
Machine Learning for Protein Function Prediction: Sequence-based Methods	**Implement a Machine Learning Model for Protein Function Prediction**
Deep Learning for Protein Structure Prediction: AlphaFold & Beyond	**Analyze the impact of AlphaFold on Biotherapeutics Discovery**
AI-Driven Design of Antibodies: Computational Antibody Design (CAD)	**Explore a CAD platform and design an antibody for a specific target**
Integrating AI with High-Throughput Screening (HTS)	**Develop a workflow integrating AI model predictions with HTS data analysis**
Machine Learning for Peptide Therapeutics Design	**Design a peptide therapeutic using a machine learning model**
	Midterm Exam
Regulatory Considerations for AI-Derived Therapeutics	**Analyze a research paper on regulatory challenges for AI-based biotherapeutics**
Ethical Implications of AI in Biotherapeutics Development	**Discuss ethical considerations of fairness, bias, and accessibility in AI-powered drug discovery**
Computer Vision: Image recognition and object detection	**Computer Vision Project Proposal**

Case Studies: Successful Applications of AI in Biotherapeutics Discovery	**Analyze a research paper on a successful AI-driven biotherapeutics project**
	Final Project

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Course|New for request 20574

Info

Request: GMS 6XXX AI-Powered Prediction of Drug Outcomes
Description of request: This course explores the application of Artificial Intelligence (AI) in predicting patient outcomes for improved clinical decision-making and personalized medicine. We will delve into machine learning and deep learning techniques for analyzing electronic health records (EHRs) and other clinical data to predict disease progression, risk of complications, and response to treatment. Additionally, the course will address ethical considerations, explainability of models, and the challenges of integrating AI into clinical workflows.

It will be included in a new online master's degree program in AI and Drug Discovery.

There is no significant overlap with existing courses. CAI 5720 and CAI 5721 focus on the general usage of AI in medicine, both clinical and experimental, and are only taught in-person. CAI 5733 focuses on AI in drug discovery but it is more of a superficial overview of topics included in multiple courses that are being submitted for approval and it is also only taught in-person. PHA 6241 addresses AI in pharmacy but is much more focused on clinical aspects rather than drug discovery.

Submitter: Stephan Jahn scjahn@ufl.edu
Created: 9/23/2024 10:35:12 AM
Form version: 1

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
GMS

Course Level
*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.). *
* *

Response:
6

- *1 = 1000 level Introductory undergraduate*
- *2 = 2000 level Introductory undergraduate*
- *3 = 3000 level Intermediate undergraduate*
- *4 = 4000 level Advanced undergraduate*
- *5 = 5000 level Introductory graduate/professional*
- *6 = 6000 level Intermediate graduate/professional*
- *7 = 7000 level Advanced graduate/professional*
- *8 = 8000 level Advanced professional*
- *4/5 = 4000/5000 Joint undergraduate/graduate*
- *4/6 = 4000/6000 Joint undergraduate/graduate*

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Committee) and require separate requests to each body*

Course Number
Enter the three-digit number indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this should be XXX until SCNS assigns an appropriate number.

Response:
XXX

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100-character limit (including spaces and punctuation) for course titles. *

Response:
AI-Powered Prediction of Drug Outcomes

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
AI & Drug Outcomes

Delivery Method
Indicate the primary intended delivery method for this course.

Response:
AD - All Distance Learning (100% of course content taught outside of classroom)

If the course is to be offered through UF Online, please include a memo of support from the UF Online program.

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year
Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic
Select “Yes” if the course routinely has varying course titles, topics, and student learning outcomes within or between semesters. Small changes to weekly topics and or texts that do not change the course description or student learning outcomes do not need to have rotating topics designation.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion. Note that credit hours are regulated by Rule 6A-10.033, FAC. If the course will be offered with variable credit, select "Variable" and then indicate the minimum and maximum credits per section. Additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
3

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission. If S/U only, please remember that the syllabus must include a grading rubric that clearly indicates how students will earn S or U grades.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:
Regularly Scheduled

• Regularly Scheduled [base hr]
• Thesis/Dissertation Supervision [1.0 headcount hr]
• Clinical Instruction [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Course Type
*Please select the type of course being created. These categories are required by the Florida Board of Governors. *

Response:
Lecture

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course. If weekly contact hours are not 1:1 for credits (e.g. 4 contact hours per week for a 2 credit course), please explain why.

Response:
3

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 500 characters or less. See course description guidelines. Please do not start the description with "This course.."

Response:
We will explore the application of Artificial Intelligence (AI) in predicting patient outcomes for improved clinical decision-making and personalized medicine. We will delve into machine learning and deep learning techniques for analyzing electronic health records (EHRs) and other clinical data to predict disease progression, risk of complications, and response to treatment. Additionally, the course will address ethical considerations, explainability of models, and the challenges of integrating

Prerequisites
*Indicate all requirements that must be satisfied prior to enrollment in the course, or enter N/A if there are none. “Permission of department” is always an option so it should not be included in any prerequisite or co-requisite. *
*Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be written so that it can be enforced in the registration system. *
Undergraduate courses level 3000 and above must have a prerequisite.
Please verify that any prerequisite courses listed are active courses.

Response:
n/a

Completing Prerequisites:

• Use “&” and “or” to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.

• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• If the course prerequisite should list a specific major and/or minor, please provide the plan code for that major/minor (e.g., undergraduate Chemistry major = CHY_BS, undergraduate Disabilities in Society minor = DIS_UMN)

*Example: *
<ol>
• Prereq published language: BSC 2010/2010L & BSC 2011/2011L & two additional Science or Math classes.
*• Prereq logic enforced for registration: BSC 2010 and BSC 2010L and BSC 2011 and BSC 2011L and (two additional Science or Math courses = any courses that are BSC 2### or greater, FAS2### or greater, BOT2### or greater, PCB2### or greater, BCH2### or greater, ZOO2### or greater, MCB 2### or greater, CHM 2### or greater, PHY 2### or greater, or STA 2### or greater).
*

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
n/a

Rationale for Placement in the Curriculum
Please indicate the degree level (Bachelors, Graduate, Professional) and program(s) (majors, minors, certificates) for which the course will be used. Please indicate if the course is intended for degree requirements or electives. Note: separate program-specific request are required to add a course into program curriculua.

Response:
This course will be included in a new online master's degree program in Artificial Intelligence and Drug Design. It will provide an introduction to basic AI principles, how AI relates to biomedical research, and particularly drug design.

Syllabus Content Requirements
<h2>Syllabus Content Requirements</h2>Please upload the syllabus for the proposed course. (Note that rotating topics courses should still submit a sample syllabus to illustrate the kind of content that will be included.) Before uploading, ensure that the syllabus contains:

• Student learning outcomes explaining what students will be able to do after successfully completing the course. These should use observable, measurable action verbs.
• Required and recommended readings for the course.
• Name of instructor(s) or planned instructor(s). If unknown, list as TBD.
• Materials and Supplies fees, if any.
• Methods by which students will be graded
• The grading scheme used in the course (e.g., what constitutes an A, an A-, etc.), along with information on current UF grading policies for assigning grade points. This may be achieved by including a link to the university grades and grading policies.
• A 15 week calendar or schedule of topics with enough detail to illustrate weekly topics, readings, and assignments (asynchronous or modular courses can arrange by modules rather than weeks).
• A statement related to class attendance, make-up exams and other work such as: “Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies.”
• A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their

instructor and discuss their access needs, as early as possible in the semester.
• A statement informing students of the online course evaluation process such as: “Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results.”

Response:
All Items Included

UF College of Medicine
Department of Pharmacology and Therapeutics
UNIVERSITY of FLORIDA

GMS 6XXX
AI-Powered Prediction of Drug Outcomes

Classroom: Online via http://elearning.ufl.edu

Course Director and Program Coordinator:
Stephan C. Jahn, Ph.D. Phone: 352-294-5543 E-mail: scjahn@ufl.edu

There are no set office hours for this online course, to best accommodate asynchronous learning. If you have questions about the material or the course, please contact one of the above individuals using E-Learning.

COURSE DESCRIPTION

This course explores the application of Artificial Intelligence (AI) in predicting patient outcomes for improved clinical decision-making and personalized medicine. We will delve into machine learning and deep learning techniques for analyzing electronic health records (EHRs) and other clinical data to predict disease progression, risk of complications, and response to treatment. Additionally, the course will address ethical considerations, explainability of models, and the challenges of integrating AI into clinical workflows.

PREREQUISITES

This course requires a BA or BS and basic skills in computer programming (Python preferred).9+989877

LEARNING RESOURCES

1. Recorded video lectures with PowerPoint presentations will be provided in E-Learning.

2. Lecture notes for each video lecture are available as PDF downloads in E-Learning.

3. While not required, recommended texts to accompany the online content are:

Introduction to Deep Learning for Healthcare by Xiao and Sun, ISBN 3030821838

Explainable Artificial Intelligence: An Introduction to Interpretable Machine Learning by Kamath and Liu, ISBN 3030833550

LEARNING OUTCOMES

1. Gain a comprehensive understanding of AI methodologies for predicting patient outcomes.
2. Analyze the application of machine learning and deep learning for risk stratification and prognosis prediction.
3. Explore the use of AI for predicting response to treatment and personalized medicine strategies.
4. Integrate and analyze electronic health records (EHRs) and other clinical data for AI models.
5. Evaluate the ethical considerations, limitations, and explainability challenges of AI in healthcare.

6. Develop skills for critically analyzing and interpreting AI-driven predictions in a clinical context.

GRADING SCALE

A numerical grade will be given at the end of the course and will be scored as follows, per University of Florida standards (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx):

92-100% = A
90-91% = A-
87-89% = B+
82-86% = B
80-81% = B-
77-79% = C+
72-76% = C
70-71% = C-
67-69% = D+
62-66% = D
60-61% = D-
<60% = E

FINAL GRADE CALCULATION

Your final grade will be calculated as below:

30% Homework
25% Midterm Exam
45% Final Project

1. **Homework: 30%**

   a. There will be periodic homework assignments throughout the semester.
   b. These will consist of
      1. Problem sets including multiple choice, matching, and similar questions.
      2. Programming exercises

2. **Midterm Exam: 25%**

   a. There will be one exam near the midpoint of the semester.
   b. It will cover all material from the first half of the semester.
   c. The exam will contain questions in the same form as the problem sets

3. **Final Project: 45%**

   a. There will be one project due near the end of the semester.
   b. It will require students to apply AI principles and skills to a specific problem relevant to the course.

EXAM PROCTORING

The exam will be monitored by ProctorU, a UF chosen service that allows the students to complete their exams at home while still ensuring academic integrity. Students will make the arrangements for exam proctoring. But all standard costs of the exam are covered in the registration costs. Last-minute appointments with ProctorU to take the exam may incur extra costs that are the responsibility of the student.

ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however, you will need to schedule your proctoring session at least 72 hours

in advance to avoid any on-demand scheduling fees. Creating a ProctorU account is simple. You can do so by visiting go.proctoru.com.

In order to use ProctorU, you will need a high-speed internet connection, a webcam (internal or external), a windows or apple operating system, and a government issued photo id. ProctorU recommends that you visit https://test-it-out.proctoru.com/ prior to your proctoring session to test your equipment. We recommend you click on the button that says "connect to a live person" to fully test out your equipment.

Additionally, please visit and review the test-taker resource center here. You should expect the startup process with the proctor to take about 10-15 minutes. However, this time will not affect your exam time. Please feel free to direct any questions to the student support team via the live chat within your account.

MAKE-UP AND LATE POLICY

There are no make-up exams allowed unless otherwise granted by the course coordinator prior to an examination date. Failure to take an exam without prior permission from the course coordinator will be recorded as 0.

All other assignments may be completed late up until final grades are posted. A penalty of 0.2% per hour will be applied to each late assignment unless due to an excused absence, as defined by UF policy https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/. At no point shall an assignment be worth less than 50% of its original value. In the event of an excused absence, the student must work with the instructor to turn in work as soon as feasible.

ACADEMIC HONESTY

Please review the complete policy of the University of Florida regarding academic dishonesty, found in the online student handbook at: http://graduateschool.ufl.edu/media/graduate-school/pdf-files/handbook.pdf. Students are expected to abide by the University of Florida Academic Honesty Guidelines and to adhere to the following pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

ACCESSIBILITY

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

IMPORTANT NOTICE ABOUT PLAGIARISM

Plagiarism is not tolerated at the University of Florida. The University of Florida has an honor code that defines plagiarism as follows: Section 3a: Plagiarism. A student shall not represent as the student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.
2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Please note that intent is not an element of this kind of violation so it is important to take great care to complete the written assignments in your own words. The first incidence of plagiarism, which will be reported to the University, may be punishable by a maximum penalty of a “0” grade for the assignment. Subsequently, a second academic honesty infraction can result in expulsion from the University.

For a complete description of the UF Honor Code and procedures, please visit: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/.

For a good discussion about plagiarism and how to properly cite your sources, please visit: http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9 .

COURSE OUTLINE

Due Dates Can Be Found on E-Learning

Videos	Problem Sets (P.S.)/ Assignments
Introduction to AI in Healthcare: Challenges & Opportunities	**Literature Review: Current Applications of AI for Predicting Patient Outcomes**
Machine Learning for Risk Stratification: Logistic Regression & Survival Analysis	**Implement a model for predicting risk of a specific disease**
Deep Learning for Prognosis Prediction: Recurrent Neural Networks (RNNs)	**Design an RNN model for predicting disease progression**
Integrating EHR Data with AI Models: Feature Engineering & Data Preprocessing	**Supervised Learning Problem Set**
AI for Personalized Medicine: Predicting Response to Treatment	**Develop an AI model for predicting response to a specific treatment**
Explainability of AI Models in Healthcare: Understanding Predictions	**Analyze the explainability of an existing AI model for patient outcomes**
	Midterm Exam
Ethical Considerations of AI in Healthcare: Bias, Fairness, and Transparency	**Discuss ethical concerns surrounding AI-driven healthcare decisions**
Regulatory Landscape & Integration of AI into Clinical Workflows	**Analyze a case study on integrating an AI tool into a clinical setting**

Future Directions: Advancements in AI for Predicting Patient Outcomes	**| Research and present on a future trend in AI-powered patient outcome prediction**
	Final Project

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Course|New for request 20573

Info

Request: GMS 6XXX AI-Powered Small Molecule Discovery
Description of request: This course explores the cutting-edge application of Artificial Intelligence (AI) in discovering novel small molecules for drug development. We will delve into the fundamental principles of machine learning and deep learning techniques used for virtual screening, lead optimization, and de novo molecule design. The course will also address the integration of biological data with AI models and explore the practical challenges and limitations of this approach.

It will be included in a new online master's degree program in AI and Drug Discovery.

There is no significant overlap with existing courses. CAI 5720 and CAI 5721 focus on the general usage of AI in medicine, both clinical and experimental, and are only taught in-person. CAI 5733 focuses on AI in drug discovery but it is more of a superficial overview of topics included in multiple courses that are being submitted for approval and it is also only taught in-person. PHA 6241 addresses AI in pharmacy but is much more focused on clinical aspects rather than drug discovery.

Submitter: Stephan Jahn scjahn@ufl.edu
Created: 9/23/2024 10:30:24 AM
Form version: 1

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
GMS

Course Level
*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.). *
* *

Response:
6

- *1 = 1000 level Introductory undergraduate*
- *2 = 2000 level Introductory undergraduate*
- *3 = 3000 level Intermediate undergraduate*
- *4 = 4000 level Advanced undergraduate*
- *5 = 5000 level Introductory graduate/professional*
- *6 = 6000 level Intermediate graduate/professional*
- *7 = 7000 level Advanced graduate/professional*
- *8 = 8000 level Advanced professional*
- *4/5 = 4000/5000 Joint undergraduate/graduate*
- *4/6 = 4000/6000 Joint undergraduate/graduate*

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Committee) and require separate requests to each body*

Course Number
Enter the three-digit number indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this should be XXX until SCNS assigns an appropriate number.

Response:
XXX

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100-character limit (including spaces and punctuation) for course titles. *

Response:
AI-Powered Small Molecule Discovery

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
AI Small Molecule Discovery

Delivery Method
Indicate the primary intended delivery method for this course.

Response:
AD - All Distance Learning (100% of course content taught outside of classroom)

If the course is to be offered through UF Online, please include a memo of support from the UF Online program.

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year

Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic
Select “Yes” if the course routinely has varying course titles, topics, and student learning outcomes within or between semesters. Small changes to weekly topics and or texts that do not change the course description or student learning outcomes do not need to have rotating topics designation.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion. Note that credit hours are regulated by Rule 6A-10.033, FAC. If the course will be offered with variable credit, select "Variable" and then indicate the minimum and maximum credits per section. Additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
3

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission. If S/U only, please remember that the syllabus must include a grading rubric that clearly indicates how students will earn S or U grades.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:
Regularly Scheduled

- *Regularly Scheduled [base hr]*
- *Thesis/Dissertation Supervision [1.0 headcount hr]*

• Clinical Instruction [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Course Type
*Please select the type of course being created. These categories are required by the Florida Board of Governors. *

Response:
Lecture

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course. If weekly contact hours are not 1:1 for credits (e.g. 4 contact hours per week for a 2 credit course), please explain why.

Response:
3

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 500 characters or less. See course description guidelines. Please do not start the description with "This course.."

Response:
We will explore the cutting-edge application of Artificial Intelligence (AI) in discovering novel small molecules for drug development. We will delve into the fundamental principles of machine learning and deep learning techniques used for virtual screening, lead optimization, and de novo molecule design. The course will also address the integration of biological data with AI models and explore the practical challenges and limitations of this approach.

Prerequisites
*Indicate all requirements that must be satisfied prior to enrollment in the course, or enter N/A if there are none. "Permission of department" is always an option so it should not be included in any prerequisite or co-requisite. *
*Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be written so that it can be enforced in the registration system. *
Undergraduate courses level 3000 and above must have a prerequisite.
Please verify that any prerequisite courses listed are active courses.

Response:
n/a

Completing Prerequisites:

• Use "&" and "or" to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would

only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• If the course prerequisite should list a specific major and/or minor, please provide the plan code for that major/minor (e.g., undergraduate Chemistry major = CHY_BS, undergraduate Disabilities in Society minor = DIS_UMN)

*Example: *
<ol>
• Prereq published language: BSC 2010/2010L & BSC 2011/2011L & two additional Science or Math classes.
*• Prereq logic enforced for registration: BSC 2010 and BSC 2010L and BSC 2011 and BSC 2011L and (two additional Science or Math courses = any courses that are BSC 2### or greater, FAS2### or greater, BOT2### or greater, PCB2### or greater, BCH2### or greater, ZOO2### or greater, MCB 2### or greater, CHM 2### or greater, PHY 2### or greater, or STA 2### or greater).
*

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
n/a

Rationale for Placement in the Curriculum
Please indicate the degree level (Bachelors, Graduate, Professional) and program(s) (majors, minors, certificates) for which the course will be used. Please indicate if the course is intended for degree requirements or electives. Note: separate program-specific request are required to add a course into program curriculua.

Response:
This course will be included in a new online master's degree program in Artificial Intelligence and Drug Design. It will provide an introduction to basic AI principles, how AI relates to biomedical research, and particularly drug design.

Syllabus Content Requirements
<h2>Syllabus Content Requirements</h2>Please upload the syllabus for the proposed course. (Note that rotating topics courses should still submit a sample syllabus to illustrate the kind of content that will be included.) Before uploading, ensure that the syllabus contains:

• Student learning outcomes explaining what students will be able to do after successfully completing the course. These should use observable, measurable action verbs.
• Required and recommended readings for the course.
• Name of instructor(s) or planned instructor(s). If unknown, list as TBD.
• Materials and Supplies fees, if any.
• Methods by which students will be graded
• The grading scheme used in the course (e.g., what constitutes an A, an A-, etc.), along with information on current UF grading policies for assigning grade points. This may be achieved by including a link to the university grades and grading policies.
• A 15 week calendar or schedule of topics with enough detail to illustrate weekly topics, readings, and assignments (asynchronous or modular courses can arrange by modules rather than weeks).
• A statement related to class attendance, make-up exams and other work such as: “Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies.”
• A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
• A statement informing students of the online course evaluation process such as: “Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course

evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results."

Response:
All Items Included

UF College of Medicine
Department of Pharmacology and Therapeutics
UNIVERSITY of FLORIDA

GMS 6XXX
AI-Powered
Small Molecule Discovery

Classroom: Online via http://elearning.ufl.edu

Course Director and Program Coordinator:
Stephan C. Jahn, Ph.D. Phone: 352-294-5543 E-mail: scjahn@ufl.edu

There are no set office hours for this online course, to best accommodate asynchronous learning. If you have questions about the material or the course, please contact one of the above individuals using E-Learning.

COURSE DESCRIPTION

This course explores the cutting-edge application of Artificial Intelligence (AI) in discovering novel small molecules for drug development. We will delve into the fundamental principles of machine learning and deep learning techniques used for virtual screening, lead optimization, and de novo molecule design. The course will also address the integration of biological data with AI models and explore the practical challenges and limitations of this approach.

PREREQUISITES

This course requires a BA or BS and basic skills in computer programming (Python preferred).

LEARNING RESOURCES

1. Recorded video lectures with PowerPoint presentations will be provided in E-Learning.

2. Lecture notes for each video lecture are available as PDF downloads in E-Learning.

3. While not required, recommended texts to accompany the online content are:

Artificial Intelligence: A Modern Approach by Russel and Norvig, ISBN 0134610997

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems by Geron, ISBN 1492032646

LEARNING OUTCOMES

1. Gain a comprehensive understanding of AI methodologies for small molecule discovery.
2. Explore machine learning and deep learning techniques for virtual screening and lead optimization.
3. Analyze the application of generative models for de novo molecule design.
4. Integrate biological data (genomics, proteomics) with AI models for drug discovery pipelines.
5. Critically evaluate the strengths and limitations of AI-powered small molecule discovery.
6. Develop skills for designing and implementing AI-based workflows for drug discovery.

GRADING SCALE

A numerical grade will be given at the end of the course and will be scored as follows, per University of Florida standards (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx):

92-100% = A
90-91% = A-
87-89% = B+
82-86% = B
80-81% = B-
77-79% = C+
72-76% = C
70-71% = C-
67-69% = D+
62-66% = D
60-61% = D-
<60% = E

FINAL GRADE CALCULATION

Your final grade will be calculated as below:

30% Homework
25% Midterm Exam
45% Final Project

1. **Homework: 30%**

    a. There will be periodic homework assignments throughout the semester.
    b. These will consist of
        1. Problem sets including multiple choice, matching, and similar questions.
        2. Programming exercises

2. **Midterm Exam: 25%**

    a. There will be one exam near the midpoint of the semester.
    b. It will cover all material from the first half of the semester.
    c. The exam will contain questions in the same form as the problem sets

3. **Final Project: 45%**

    a. There will be one project due near the end of the semester.
    b. It will require students to apply AI principles and skills to a specific problem relevant to the course.

EXAM PROCTORING

The exam will be monitored by ProctorU, a UF chosen service that allows the students to complete their exams at home while still ensuring academic integrity. Students will make the arrangements for exam proctoring. But all standard costs of the exam are covered in the registration costs. Last-minute appointments with ProctorU to take the exam may incur extra costs that are the responsibility of the student.

ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however, you will need to schedule your proctoring session at least 72 hours in advance to avoid any on-demand scheduling fees. Creating a ProctorU account is simple. You can do so by visiting go.proctoru.com.

In order to use ProctorU, you will need a high-speed internet connection, a webcam (internal or external), a windows or apple operating system, and a government issued photo id. ProctorU recommends that you visit https://test-it-out.proctoru.com/ prior to your proctoring session to test your equipment. We recommend you click on the button that says “connect to a live person” to fully test out your equipment.

Additionally, please visit and review the test-taker resource center here. You should expect the startup process with the proctor to take about 10-15 minutes. However, this time will not affect your exam time. Please feel free to direct any questions to the student support team via the live chat within your account.

MAKE-UP AND LATE POLICY

There are no make-up exams allowed unless otherwise granted by the course coordinator prior to an examination date. Failure to take an exam without prior permission from the course coordinator will be recorded as 0.

All other assignments may be completed late up until final grades are posted. A penalty of 0.2% per hour will be applied to each late assignment unless due to an excused absence, as defined by UF policy https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/. At no point shall an assignment be worth less than 50% of its original value. In the event of an excused absence, the student must work with the instructor to turn in work as soon as feasible.

ACADEMIC HONESTY

Please review the complete policy of the University of Florida regarding academic dishonesty, found in the online student handbook at: http://graduateschool.ufl.edu/media/graduate-school/pdf-files/handbook.pdf. Students are expected to abide by the University of Florida Academic Honesty Guidelines and to adhere to the following pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

ACCESSIBILITY

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

IMPORTANT NOTICE ABOUT PLAGIARISM

Plagiarism is not tolerated at the University of Florida. The University of Florida has an honor code that defines plagiarism as follows: Section 3a: Plagiarism. A student shall not represent as the student’s own work all or any portion of the work of another. Plagiarism includes but is not limited to:

1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.
2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Please note that intent is not an element of this kind of violation so it is important to take great care to complete the written assignments in your own words. The first incidence of plagiarism, which will be reported to the

University, may be punishable by a maximum penalty of a “0” grade for the assignment. Subsequently, a second academic honesty infraction can result in expulsion from the University.

For a complete description of the UF Honor Code and procedures, please visit: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/.

For a good discussion about plagiarism and how to properly cite your sources, please visit: http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9 .

COURSE OUTLINE

Due Dates Can Be Found on E-Learning

Videos	Assignments
Introduction to AI for Drug Discovery: Overview and Challenges	**Literature Review: Current AI Applications in Drug Discovery**
Machine Learning for Virtual Screening: Similarity-based & Classification Models	**Implement a kNN-based Virtual Screening Model**
Deep Learning for Virtual Screening: Convolutional Neural Networks (CNNs)	**Build a CNN Model for Virtual Screening using a public dataset**
Integrating Biological Data with AI Models: Genomics & Proteomics	**Analyze gene expression data and incorporate it into your virtual screening model (Optional)**
Lead Optimization with AI: Property Prediction and ADMET Analysis	**Develop a Machine Learning Model for Predicting ADMET Properties**
De Novo Molecule Design with Generative Models: Variational Autoencoders (VAEs)	**Explore VAEs for de novo molecule generation (Project Proposal Due)**
Midterm Exam	
Case Studies: Successful Applications of AI in Drug Discovery	**Analyze a research paper on successful AI-driven drug discovery**
Practical Considerations & Challenges: Explainability, Bias, and Reproducibility	**Discuss ethical considerations and limitations of AI in drug discovery**
Future Directions: Advancements in AI & Integration with other Technologies	**Research and present on a future trend in AI-powered drug discovery**

	Final Project

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Course|New for request 20571

Info

Request: GMS 6XXX Fundamentals of Biomedical AI
Description of request: This course provides a comprehensive introduction to the field of Artificial Intelligence (AI). It explores the fundamental concepts, historical development, and various applications of AI. We will delve into core machine learning techniques and explore subfields like natural language processing and computer vision. Ethical considerations, societal impact, and future directions of AI research will also be addressed.

It will be included in a new online master's degree program in AI and Drug Discovery.

There is no significant overlap with existing courses. CAI 5720 and CAI 5721 focus on the general usage of AI in medicine, both clinical and experimental, and are only taught in-person. CAI 5733 focuses on AI in drug discovery but it is more of a superficial overview of topics included in multiple courses that are being submitted for approval and it is also only taught in-person. PHA 6241 addresses AI in pharmacy but is much more focused on clinical aspects rather than drug discovery.

Submitter: Stephan Jahn scjahn@ufl.edu
Created: 9/23/2024 10:26:02 AM
Form version: 2

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
GMS

Course Level
*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.). *
* *

Response:
6

- *1 = 1000 level Introductory undergraduate*
- *2 = 2000 level Introductory undergraduate*
- *3 = 3000 level Intermediate undergraduate*
- *4 = 4000 level Advanced undergraduate*
- *5 = 5000 level Introductory graduate/professional*
- *6 = 6000 level Intermediate graduate/professional*
- *7 = 7000 level Advanced graduate/professional*
- *8 = 8000 level Advanced professional*
- *4/5 = 4000/5000 Joint undergraduate/graduate*
- *4/6 = 4000/6000 Joint undergraduate/graduate*

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Committee) and require separate requests to each body*

Course Number
Enter the three-digit number indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this should be XXX until SCNS assigns an appropriate number.

Response:
XXX

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100-character limit (including spaces and punctuation) for course titles. *

Response:
Fundamentals of Biomedical AI

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
Fundamentals Biomedical AI

Delivery Method
Indicate the primary intended delivery method for this course.

Response:
AD - All Distance Learning (100% of course content taught outside of classroom)

If the course is to be offered through UF Online, please include a memo of support from the UF Online program.

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year

Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic
Select “Yes” if the course routinely has varying course titles, topics, and student learning outcomes within or between semesters. Small changes to weekly topics and or texts that do not change the course description or student learning outcomes do not need to have rotating topics designation.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion. Note that credit hours are regulated by Rule 6A-10.033, FAC. If the course will be offered with variable credit, select "Variable" and then indicate the minimum and maximum credits per section. Additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
3

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission. If S/U only, please remember that the syllabus must include a grading rubric that clearly indicates how students will earn S or U grades.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:
Regularly Scheduled

- *Regularly Scheduled [base hr]*
- *Thesis/Dissertation Supervision [1.0 headcount hr]*

• Clinical Instruction [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Course Type
*Please select the type of course being created. These categories are required by the Florida Board of Governors. *

Response:
Lecture

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course. If weekly contact hours are not 1:1 for credits (e.g. 4 contact hours per week for a 2 credit course), please explain why.

Response:
3

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 500 characters or less. See course description guidelines. Please do not start the description with "This course.."

Response:
We will provide a comprehensive introduction to the field of Artificial Intelligence (AI). It explores the fundamental concepts, historical development, and various applications of AI. We will delve into core machine learning techniques and explore subfields like natural language processing and computer vision. Ethical considerations, societal impact, and future directions of AI research will also be addressed.

Prerequisites
*Indicate all requirements that must be satisfied prior to enrollment in the course, or enter N/A if there are none. “Permission of department” is always an option so it should not be included in any prerequisite or co-requisite. *
*Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be written so that it can be enforced in the registration system. *
Undergraduate courses level 3000 and above must have a prerequisite.
Please verify that any prerequisite courses listed are active courses.

Response:
N/A

Completing Prerequisites:

• Use “&” and “or” to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would

only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• If the course prerequisite should list a specific major and/or minor, please provide the plan code for that major/minor (e.g., undergraduate Chemistry major = CHY_BS, undergraduate Disabilities in Society minor = DIS_UMN)

*Example: *
<ol>
• Prereq published language: BSC 2010/2010L & BSC 2011/2011L & two additional Science or Math classes.
*• Prereq logic enforced for registration: BSC 2010 and BSC 2010L and BSC 2011 and BSC 2011L and (two additional Science or Math courses = any courses that are BSC 2### or greater, FAS2### or greater, BOT2### or greater, PCB2### or greater, BCH2### or greater, ZOO2### or greater, MCB 2### or greater, CHM 2### or greater, PHY 2### or greater, or STA 2### or greater).
*

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
N/A

Rationale for Placement in the Curriculum
Please indicate the degree level (Bachelors, Graduate, Professional) and program(s) (majors, minors, certificates) for which the course will be used. Please indicate if the course is intended for degree requirements or electives. Note: separate program-specific request are required to add a course into program curriculua.

Response:
This course will be included in a new online master's degree program in Artificial Intelligence and Drug Design. It will provide an introduction to basic AI principles, how AI relates to biomedical research, and particularly drug design.

Syllabus Content Requirements
<h2>Syllabus Content Requirements</h2>Please upload the syllabus for the proposed course. (Note that rotating topics courses should still submit a sample syllabus to illustrate the kind of content that will be included.) Before uploading, ensure that the syllabus contains:

• Student learning outcomes explaining what students will be able to do after successfully completing the course. These should use observable, measurable action verbs.
• Required and recommended readings for the course.
• Name of instructor(s) or planned instructor(s). If unknown, list as TBD.
• Materials and Supplies fees, if any.
• Methods by which students will be graded
• The grading scheme used in the course (e.g., what constitutes an A, an A-, etc.), along with information on current UF grading policies for assigning grade points. This may be achieved by including a link to the university grades and grading policies.
• A 15 week calendar or schedule of topics with enough detail to illustrate weekly topics, readings, and assignments (asynchronous or modular courses can arrange by modules rather than weeks).
• A statement related to class attendance, make-up exams and other work such as: “Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies.”
• A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
• A statement informing students of the online course evaluation process such as: “Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course

evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results."

Response:
All Items Included

UF College of Medicine
Department of Pharmacology and Therapeutics
UNIVERSITY of FLORIDA

GMS 6XXX
Fundamentals of Biomedical AI

Classroom: Online via http://elearning.ufl.edu

Course Director and Program Coordinator:
Stephan C. Jahn, Ph.D. Phone: 352-294-5543 E-mail: scjahn@ufl.edu

There are no set office hours for this online course, to best accommodate asynchronous learning. If you have questions about the material or the course, please contact one of the above individuals using E-Learning.

COURSE DESCRIPTION

This course provides a comprehensive introduction to the field of Artificial Intelligence (AI). It explores the fundamental concepts, historical development, and various applications of AI. We will delve into core machine learning techniques and explore subfields like natural language processing and computer vision. Ethical considerations, societal impact, and future directions of AI research will also be addressed.

PREREQUISITES

This course requires a BA or BS and basic skills in computer programming (Python preferred).

LEARNING RESOURCES

1. Recorded video lectures with PowerPoint presentations will be provided in E-Learning.

2. Lecture notes for each video lecture are available as PDF downloads in E-Learning.

3. While not required, recommended texts to accompany the online content are:

Artificial Intelligence: A Modern Approach by Russel and Norvig, ISBN 0134610997

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems by Geron, ISBN 1492032646

LEARNING OUTCOMES

1. Understand the core concepts and history of Artificial Intelligence.
2. Gain knowledge of fundamental machine learning algorithms.
3. Apply machine learning techniques to solve problems.
4. Explore key subfields of AI like natural language processing and computer vision.
5. Analyze the ethical implications and societal impact of AI.
6. Develop critical thinking skills to evaluate the potential and limitations of AI.

GRADING SCALE

A numerical grade will be given at the end of the course and will be scored as follows, per University of Florida standards (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx):

92-100% = A
90-91% = A-
87-89% = B+
82-86% = B
80-81% = B-
77-79% = C+
72-76% = C
70-71% = C-
67-69% = D+
62-66% = D
60-61% = D-
<60% = E

FINAL GRADE CALCULATION

Your final grade will be calculated as below:

30% Homework
25% Midterm Exam
45% Final Project

1. **Homework: 30%**

    a. There will be periodic homework assignments throughout the semester.
    b. These will consist of
        1. Problem sets including multiple choice, matching, and similar questions.
        2. Programming exercises

2. **Midterm Exam: 25%**

    a. There will be one exam near the midpoint of the semester.
    b. It will cover all material from the first half of the semester.
    c. The exam will contain questions in the same form as the problem sets

3. **Final Project: 45%**

    a. There will be one project due near the end of the semester.
    b. It will require students to apply AI principles and skills to a specific problem relevant to the course.

EXAM PROCTORING

The exam will be monitored by ProctorU, a UF chosen service that allows the students to complete their exams at home while still ensuring academic integrity. Students will make the arrangements for exam proctoring. But all standard costs of the exam are covered in the registration costs. Last-minute appointments with ProctorU to take the exam may incur extra costs that are the responsibility of the student.

ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however, you will need to schedule your proctoring session at least 72 hours in advance to avoid any on-demand scheduling fees. Creating a ProctorU account is simple. You can do so by visiting go.proctoru.com.

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1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.
2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Please note that intent is not an element of this kind of violation so it is important to take great care to complete the written assignments in your own words. The first incidence of plagiarism, which will be reported to the University, may be punishable by a maximum penalty of a “0” grade for the assignment. Subsequently, a

second academic honesty infraction can result in expulsion from the University.

For a complete description of the UF Honor Code and procedures, please visit: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/.

For a good discussion about plagiarism and how to properly cite your sources, please visit: http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9 .

COURSE OUTLINE

Due Dates Can Be Found on E-Learning

Videos	Problem Sets (P.S.)/ Assignments
Introduction to AI: What is it and why is it important? History of AI	**Introductory AI P.S.**
Intelligent Agents: Problem solving, search algorithms, and game playing	**Search Algorithm Implementation**
Knowledge Representation and Reasoning: Logic, knowledge bases, and reasoning methods	**Logic Puzzle**
Machine Learning Fundamentals: Supervised Learning	**Supervised Learning Problem Set**
Machine Learning Techniques: Regression and Classification	**Classification Algorithm Implementation**
Unsupervised Learning: Clustering and Dimensionality Reduction	**Unsupervised Learning P.S.**
	Midterm Exam
Deep Learning: Neural Networks & Applications	**Deep Learning Exploration**
Natural Language Processing: Text analysis and language understanding	**NLP Task Implementation**
Computer Vision: Image recognition and object detection	**Computer Vision Project Proposal**
Robotics: Introduction to AI in Robotics and Autonomous Systems	

AI Ethics and Societal Impact: Fairness, Bias, and Transparency	
The Future of AI: Trends and Potential Applications	
	Final Project

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Course|New for request 20576

Info

Request: GMS 6XXX Independent Study in AI and Drug Discovery
Description of request: This independent study explores the application of Artificial Intelligence (AI) in drug discovery. You will delve into machine learning and deep learning techniques used for various stages of the drug discovery pipeline, from virtual screening to lead optimization. Additionally, you will explore the integration of biological data with AI models and critically analyze the current limitations and future directions of this field.

It will be included in a new online master's degree program in AI and Drug Discovery.
Submitter: Stephan Jahn scjahn@ufl.edu
Created: 9/23/2024 10:41:54 AM
Form version: 1

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
GMS

Course Level
*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.). *
* *

Response:
6

• 1 = 1000 level Introductory undergraduate
• 2 = 2000 level Introductory undergraduate
• 3 = 3000 level Intermediate undergraduate
• 4 = 4000 level Advanced undergraduate
• 5 = 5000 level Introductory graduate/professional
• 6 = 6000 level Intermediate graduate/professional
• 7 = 7000 level Advanced graduate/professional
• 8 = 8000 level Advanced professional
• 4/5 = 4000/5000 Joint undergraduate/graduate
• 4/6 = 4000/6000 Joint undergraduate/graduate

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Committee) and require separate requests to each body*

Course Number
Enter the three-digit number indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this should be XXX until SCNS assigns an appropriate number.

Response:

XXX

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100-character limit (including spaces and punctuation) for course titles. *

Response:
Independent Study In AI and Drug Discovery

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
Independ Study AI Drug Discove

Delivery Method
Indicate the primary intended delivery method for this course.

Response:
AD - All Distance Learning (100% of course content taught outside of classroom)

If the course is to be offered through UF Online, please include a memo of support from the UF Online program.

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year
Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic
Select “Yes” if the course routinely has varying course titles, topics, and student learning outcomes within or between semesters. Small changes to weekly topics and or texts that do not change the course description or student learning outcomes do not need to have rotating topics designation.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion. Note that credit hours are regulated by Rule 6A-10.033, FAC. If the course will be offered with variable credit, select "Variable" and then indicate the minimum and maximum credits per section. Additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
2

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission. If S/U only, please remember that the syllabus must include a grading rubric that clearly indicates how students will earn S or U grades.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:
Directed Individual Studies

- *Regularly Scheduled [base hr]*
- *Thesis/Dissertation Supervision [1.0 headcount hr]*
- *Clinical Instruction [1.0 headcount hr]*
- *Directed Individual Studies [0.5 headcount hr]*
- *Supervision of Student Interns [0.8 headcount hr]*
- *Supervision of Teaching/Research [0.5 headcount hr]*
- *Supervision of Cooperative Education [0.8 headcount hr]*

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Course Type
*Please select the type of course being created. These categories are required by the Florida Board of Governors. *

Response:
Independent Study

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course. If weekly contact hours are not 1:1 for credits (e.g. 4 contact hours per week for a 2 credit course), please explain why.

Response:
1

This is a 2-credit independent study and, as such, will average 1 hour of contact per week.

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 500 characters or less. See course description guidelines. Please do not start the description with "This course.."

Response:
The independent study explores the application of Artificial Intelligence (AI) in drug discovery. You will delve into machine learning and deep learning techniques used for various stages of the drug discovery pipeline, from virtual screening to lead optimization. Additionally, you will explore the integration of biological data with AI models and critically analyze the current limitations and future directions of this field.

Prerequisites
*Indicate all requirements that must be satisfied prior to enrollment in the course, or enter N/A if there are none. "Permission of department" is always an option so it should not be included in any prerequisite or co-requisite. *
*Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be written so that it can be enforced in the registration system. *
Undergraduate courses level 3000 and above must have a prerequisite.
Please verify that any prerequisite courses listed are active courses.

Response:
n/a

Completing Prerequisites:

• Use "&" and "or" to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• If the course prerequisite should list a specific major and/or minor, please provide the plan code for that major/minor (e.g., undergraduate Chemistry major = CHY_BS, undergraduate Disabilities in Society minor =

DIS_UMN)

*Example: *
<ol>
• Prereq published language: BSC 2010/2010L & BSC 2011/2011L & two additional Science or Math classes.
*• Prereq logic enforced for registration: BSC 2010 and BSC 2010L and BSC 2011 and BSC 2011L and (two additional Science or Math courses = any courses that are BSC 2### or greater, FAS2### or greater, BOT2### or greater, PCB2### or greater, BCH2### or greater, ZOO2### or greater, MCB 2### or greater, CHM 2### or greater, PHY 2### or greater, or STA 2### or greater).
*

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
n/a

Rationale for Placement in the Curriculum
Please indicate the degree level (Bachelors, Graduate, Professional) and program(s) (majors, minors, certificates) for which the course will be used. Please indicate if the course is intended for degree requirements or electives. Note: separate program-specific request are required to add a course into program curriculua.

Response:
This course will be included in a new online master's degree program in Artificial Intelligence and Drug Design. It will provide an introduction to basic AI principles, how AI relates to biomedical research, and particularly drug design.

Syllabus Content Requirements
<h2>Syllabus Content Requirements</h2>Please upload the syllabus for the proposed course. (Note that rotating topics courses should still submit a sample syllabus to illustrate the kind of content that will be included.) Before uploading, ensure that the syllabus contains:

• Student learning outcomes explaining what students will be able to do after successfully completing the course. These should use observable, measurable action verbs.
• Required and recommended readings for the course.
• Name of instructor(s) or planned instructor(s). If unknown, list as TBD.
• Materials and Supplies fees, if any.
• Methods by which students will be graded
• The grading scheme used in the course (e.g., what constitutes an A, an A-, etc.), along with information on current UF grading policies for assigning grade points. This may be achieved by including a link to the university grades and grading policies.
• A 15 week calendar or schedule of topics with enough detail to illustrate weekly topics, readings, and assignments (asynchronous or modular courses can arrange by modules rather than weeks).
• A statement related to class attendance, make-up exams and other work such as: “Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies.”
• A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
• A statement informing students of the online course evaluation process such as: “Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <a

href="https://ufl.bluera.com/ufl/">https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results."

Response:
All Items Included

UF College of Medicine
Department of Pharmacology and Therapeutics
UNIVERSITY of FLORIDA

GMS 6XXX
Independent Study In AI and Drug Discovery

Classroom: Online via http://elearning.ufl.edu

Course Director and Program Coordinator:
Stephan C. Jahn, Ph.D. Phone: 352-294-5543 E-mail: scjahn@ufl.edu

There are no set office hours for this online course, to best accommodate asynchronous learning. If you have questions about the material or the course, please contact one of the above individuals using E-Learning.

COURSE DESCRIPTION

This independent study explores the application of Artificial Intelligence (AI) in drug discovery. You will delve into machine learning and deep learning techniques used for various stages of the drug discovery pipeline, from virtual screening to lead optimization. Additionally, you will explore the integration of biological data with AI models and critically analyze the current limitations and future directions of this field.

PREREQUISITES

This course requires a BA or BS and basic skills in computer programming (Python preferred).

LEARNING OUTCOMES

1. Gain a comprehensive understanding of the major AI methodologies used in drug discovery.
2. Analyze the application of machine learning and deep learning for virtual screening and lead optimization.
3. Explore the use of AI for de novo molecule design and target identification.
4. Understand the integration of biological data (genomics, proteomics) with AI models for drug discovery pipelines.
5. Critically evaluate the strengths and limitations of AI-powered drug discovery.
6. Develop proficiency in researching, analyzing, and presenting findings on AI in drug discovery.

GRADING SCALE

A numerical grade will be given at the end of the course and will be scored as follows, per University of Florida standards (https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx):

92-100% = A
90-91% = A-
87-89% = B+
82-86% = B
80-81% = B-
77-79% = C+

72-76% = C
70-71% = C-
67-69% = D+
62-66% = D
60-61% = D-
<60% = E

FINAL GRADE CALCULATION

Your final grade will be calculated as below:

20% Literature Review & Learning Activities
30% Project Proposal & Progress Reports
50% Final Project Report & Presentation

1. **Literature Review & Learning Activities: 20%**

    a. Students will complete and submit a literature review of materials relevant to their chosen project.
    b. Students will complete learning activities and simulations as needed to complete their project.

2. **Project Proposal & Progress Reports: 30%**

    a. Students must submit a project proposal outlining their research question, methodology, and expected outcomes.
    b. Students must submit bi-weekly progress reports documenting their research journey.

3. **Final Project Report: 25%**

    a. Students will write a comprehensive written report presenting their project findings, methodology, analysis, and conclusions.

4. **Final Project Presentation: 25%**

    a. Students will record and submit a final presentation summarizing their research and its potential impact.

EXAM PROCTORING

The exam will be monitored by ProctorU, a UF chosen service that allows the students to complete their exams at home while still ensuring academic integrity. Students will make the arrangements for exam proctoring. But all standard costs of the exam are covered in the registration costs. Last-minute appointments with ProctorU to take the exam may incur extra costs that are the responsibility of the student.

ProctorU is a live online proctoring service that allows you to take your exam from the comfort of your home. ProctorU is available 24/7, however, you will need to schedule your proctoring session at least 72 hours in advance to avoid any on-demand scheduling fees. Creating a ProctorU account is simple. You can do so by visiting go.proctoru.com.

In order to use ProctorU, you will need a high-speed internet connection, a webcam (internal or external), a windows or apple operating system, and a government issued photo id. ProctorU recommends that you visit https://test-it-out.proctoru.com/ prior to your proctoring session to test your equipment. We recommend you click on the button that says “connect to a live person” to fully test out your equipment.

Additionally, please visit and review the test-taker resource center here. You should expect the startup process with the proctor to take about 10-15 minutes. However, this time will not affect your exam time. Please feel free to direct any questions to the student support team via the live chat within your account.

MAKE-UP AND LATE POLICY

There are no make-up exams allowed unless otherwise granted by the course coordinator prior to an examination date. Failure to take an exam without prior permission from the course coordinator will be recorded as 0.

All other assignments may be completed late up until final grades are posted. A penalty of 0.2% per hour will be applied to each late assignment unless due to an excused absence, as defined by UF policy https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/. At no point shall an assignment be worth less than 50% of its original value. In the event of an excused absence, the student must work with the instructor to turn in work as soon as feasible.

ACADEMIC HONESTY

Please review the complete policy of the University of Florida regarding academic dishonesty, found in the online student handbook at: http://graduateschool.ufl.edu/media/graduate-school/pdf-files/handbook.pdf. Students are expected to abide by the University of Florida Academic Honesty Guidelines and to adhere to the following pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

ACCESSIBILITY

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

IMPORTANT NOTICE ABOUT PLAGIARISM

Plagiarism is not tolerated at the University of Florida. The University of Florida has an honor code that defines plagiarism as follows: Section 3a: Plagiarism. A student shall not represent as the student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:

1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.
2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.

Please note that intent is not an element of this kind of violation so it is important to take great care to complete the written assignments in your own words. The first incidence of plagiarism, which will be reported to the University, may be punishable by a maximum penalty of a "0" grade for the assignment. Subsequently, a second academic honesty infraction can result in expulsion from the University.

For a complete description of the UF Honor Code and procedures, please visit: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/.

For a good discussion about plagiarism and how to properly cite your sources, please visit: http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9 .

COURSE OUTLINE

Due Dates Can Be Found on E-Learning

Week	Goal	To Submit
1	**Define your research focus and project proposal development.**	**Brief summary of intended project.**
2-4	**Conduct a comprehensive review of relevant research papers and resources.**	**Progress Report** **Literature Review**
5-8	**Learn and practice relevant software tools for your project.**	**Progress Reports** **Summary of learning materials used.**
9-12	**Begin building your AI model or analysis workflow for your chosen project.**	**Progress Reports**
13-15	**Refine your project, analyze results, and draw conclusions.**	**Progress Reports**
16		**Final Report** **Final Presentation**

COURSE EVALUATION

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Course|New for request 20549

Info

Request: PHA 6XXX AI for Drug Discovery
Description of request: Create new course
Submitter: Katie McFarland katiemcd3@cop.ufl.edu
Created: 9/12/2024 2:41:47 PM
Form version: 1

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
PHA

Course Level
*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.). *
* *

Response:
6

• 1 = 1000 level Introductory undergraduate
• 2 = 2000 level Introductory undergraduate
• 3 = 3000 level Intermediate undergraduate
• 4 = 4000 level Advanced undergraduate
• 5 = 5000 level Introductory graduate/professional
• 6 = 6000 level Intermediate graduate/professional
• 7 = 7000 level Advanced graduate/professional
• 8 = 8000 level Advanced professional
• 4/5 = 4000/5000 Joint undergraduate/graduate
• 4/6 = 4000/6000 Joint undergraduate/graduate

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Committee) and require separate requests to each body*

Course Number
Enter the three-digit number indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this should be XXX until SCNS assigns an appropriate number.

Response:
xxx

Lab Code

Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100-character limit (including spaces and punctuation) for course titles. *

Response:
AI for Drug Discovery

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
AI for Drug Discovery

Delivery Method
Indicate the primary intended delivery method for this course.

Response:
PC - Primarily Classroom (0-49% of course content taught outside of classroom)

If the course is to be offered through UF Online, please include a memo of support from the UF Online program.

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year
Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic
Select "Yes" if the course routinely has varying course titles, topics, and student learning outcomes within or between semesters. Small changes to weekly topics and or texts that do not change the course description or student learning outcomes do not need to have rotating topics designation.

Response:

No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion. Note that credit hours are regulated by Rule 6A-10.033, FAC. If the course will be offered with variable credit, select "Variable" and then indicate the minimum and maximum credits per section. Additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
3

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission. If S/U only, please remember that the syllabus must include a grading rubric that clearly indicates how students will earn S or U grades.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:
Regularly Scheduled

• Regularly Scheduled [base hr]
• Thesis/Dissertation Supervision [1.0 headcount hr]
• Clinical Instruction [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Course Type

*Please select the type of course being created. These categories are required by the Florida Board of Governors. *

Response:
Lecture

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course. If weekly contact hours are not 1:1 for credits (e.g. 4 contact hours per week for a 2 credit course), please explain why.

Response:
3

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 500 characters or less. See course description guidelines. Please do not start the description with "This course.."

Response:
This course is designed to provide a comprehensive understanding of the integration of artificial intelligence (AI) in drug discovery. It covers cheminformatics, machine learning, deep learning, and their applications for small molecule and biologics drug design and discovery. Students will gain both a general understanding and hands-on experience of AI applications in drug discovery.

Prerequisites
*Indicate all requirements that must be satisfied prior to enrollment in the course, or enter N/A if there are none. "Permission of department" is always an option so it should not be included in any prerequisite or co-requisite. *
*Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be written so that it can be enforced in the registration system. *
Undergraduate courses level 3000 and above must have a prerequisite.
Please verify that any prerequisite courses listed are active courses.

Response:
N/A

Completing Prerequisites:

• Use "&" and "or" to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• If the course prerequisite should list a specific major and/or minor, please provide the plan code for that major/minor (e.g., undergraduate Chemistry major = CHY_BS, undergraduate Disabilities in Society minor = DIS_UMN)

*Example: *
<ol>
• Prereq published language: BSC 2010/2010L & BSC 2011/2011L & two additional Science or Math classes.
• Prereq logic enforced for registration: BSC 2010 and BSC 2010L and BSC 2011 and BSC 2011L and (two additional Science or Math courses = any courses that are BSC 2### or greater, FAS2### or greater, BOT2### or greater, PCB2### or greater, BCH2### or greater, ZOO2### or greater, MCB 2### or greater, CHM 2### or

*greater, PHY 2### or greater, or STA 2### or greater).
*

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
N/A

Rationale for Placement in the Curriculum
Please indicate the degree level (Bachelors, Graduate, Professional) and program(s) (majors, minors, certificates) for which the course will be used. Please indicate if the course is intended for degree requirements or electives. Note: separate program-specific request are required to add a course into program curriculua.

Response:
Degree Level: Graduate.
Program/Major: Pharmaceutical Sciences
Course type: elective (used to fulfil didactic requirements)

Syllabus Content Requirements
<h2>Syllabus Content Requirements</h2>Please upload the syllabus for the proposed course. (Note that rotating topics courses should still submit a sample syllabus to illustrate the kind of content that will be included.) Before uploading, ensure that the syllabus contains:

• Student learning outcomes explaining what students will be able to do after successfully completing the course. These should use observable, measurable action verbs.
• Required and recommended readings for the course.
• Name of instructor(s) or planned instructor(s). If unknown, list as TBD.
• Materials and Supplies fees, if any.
• Methods by which students will be graded
• The grading scheme used in the course (e.g., what constitutes an A, an A-, etc.), along with information on current UF grading policies for assigning grade points. This may be achieved by including a link to the university grades and grading policies.
• A 15 week calendar or schedule of topics with enough detail to illustrate weekly topics, readings, and assignments (asynchronous or modular courses can arrange by modules rather than weeks).
• A statement related to class attendance, make-up exams and other work such as: "Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies."
• A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
• A statement informing students of the online course evaluation process such as: "Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results."

Response:
All Items Included

PHA6xxx – AI for Drug Discovery

3 credit hours

Fall 2024

Course Coordinator:

Yanjun Li, Ph.D., Assistant Professor of Medicinal Chemistry
Wenjun Xie, Ph.D., Assistant Professor of Medicinal Chemistry
Chenglong Li, Ph.D. Professor of Medicinal Chemistry

Phone: (352) 273-9957, (352) 273-8846, (352)-294-8510
Office: P6-33, P6-29, P6-31
Email: yanjun.li@ufl.edu, wenjunxie@ufl.edu, lic@cop.ufl.edu

Class Time: MWF 10:00 am - 12:00 pm. Most of the lectures will be 1 hour in length and start at 10 am. Any changes to class times and dates will be communicated in advance.

Classroom: Lectures and exams will be held in Communicore Rooms. Please pay close attention to assigned classroom locations listed on the schedule (next page).

Canvas Website: Course materials, including pre-reading materials/handouts, and announcements can be found on the Canvas Website that is associated with this course.

Course Description: This course is designed to provide a comprehensive understanding of the integration of artificial intelligence (AI) in drug discovery. It covers cheminformatics, machine learning, deep learning, and their applications for small molecule and biologics drug design and discovery. Students will gain both a general understanding and hands-on experience of AI applications in drug discovery.

Course Objectives:

1. To grasp the core concepts of AI and its role in revolutionizing drug discovery.
2. To understand and apply machine learning and deep learning methodologies in drug design and analysis.
3. To develop innovative approaches using AI for solving complex problems in drug discovery.

Textbooks and Resources:

1. "Deep Learning" by Ian Goodfellow et al.
2. "Fluent Python, 2nd Edition" by Luciano Ramalho.
3. "Deep Learning for Molecules and Materials" by Andrew White
4. "Deep Learning for the Life Sciences" by Bharath Ramsundar et al.
5. "Teaching Computer-Aided Drug Design Using TeachOpenCADD" by Dominique Sydow et al.
6. Supplementary materials, including research papers and online tutorials.

Prerequisites: Basic knowledge of biology and chemistry, foundational understanding of machine learning, deep learning, and programming (preferably in Python).

Course Calendar:

Date		Subject	Lecturer (Room Location)
Aug.	23	Overview of Drug Discovery and AI Impact	C. Li (CG-056)
	26	Traditional ligand- and structure-based drug design	C. Li (CG-056)
	28	Introduction to Cheminformatics	Seabra (CG-056)
	30	Molecular Databases Manipulation & Filtering	Seabra (CG-056)
Sep.	**2**	**Holiday – NO CLASS**	
	4	Fundamentals of Artificial Intelligence	Y. Li (CG-056)
	6	Convolutional Neural Network	Y. Li (CG-056)
	9	Recurrent Neural Network	Y. Li (CG-056)
	11	Attention and Transformers	Y. Li (CG-056)
	13	Graph Neural Network	Y. Li (CG-056)
	16	Generative Models	Y. Li (CG-056)
	18	Self-supervised Learning	Y. Li (CG-056)
	20	Morphological Profiling for Phenotypic Drug Discovery	Y. Li (CG-056)
	23	Drug Target Identification	Y. Li (CG-056)
	25	Molecular Property Prediction	Y. Li (CG-056)
	27	Ligand Binding Site and Pose Prediction	C. Li (CG-056)
	30	Protein-Ligand Interaction Prediction	C. Li (CG-056)
Oct.	2	Molecular Database Screening	Seabra (CG-056)
	4	**Mid-term Presentation (I)**	**CG-056**
	7	**Mid-term Presentation (II)**	**CG-056**
	9	De Novo Small Molecule Design (I)	Seabra (CG-056)
	11	De Novo Small Molecule Design (II)	Seabra (CG-056)
	14	Protein Drugs and AI	Xie (CG-056)
	16	Protein Structure Prediction (I)	Xie (CG-056)
	18	**Homecoming – NO CLASS**	
	21	Protein Structure Prediction (II)	Xie (CG-056)
	23	Inverse Protein Folding	Xie (CG-056)
	25	Antibody Design	Xie (CG-056)
	28	Binder Design	Xie (CG-056)
	30	Enzyme Design	Xie (CG-056)
Nov.	1	Protein Function Prediction	Xie (CG-056)
	4	Protein Design Workshop	Xie (CG-056)
	6	AI Empowered RNA Research	Guest lecture (CG-056)
	8	AI for Biomedical Research	Guest lecture (CG-056)
	11	**Holiday – NO CLASS**	
	13	AI for Genetic Disease Research	Guest lecture (CG-056)
	15	AI for Phenotypic Drug Discovery	Guest lecture (CG-056)
	18	AI for Functional Genomics Research	Guest lecture (CG-056)
	20	AI for Protein-Drug Interaction	Guest lecture (CG-056)
	22	AI for Translational Bioinformatics	Guest lecture (CG-056)
	25-29	**Holiday – NO CLASS**	
Dec.	**2**	**Final Project Presentation (I)**	**CG-056**
	4	**Final Project Presentation (II)**	**CG-056**
	6	**Final Project Presentation (III)**	**CG-056**

EXAMS AND GRADING:

Format:

The format of the course will involve lectures using combinations of Power Point presentations, chalk-board presentations, overhead projection and handouts to deliver the materials.

Guest Lectures:

The course will include guest lectures by experts in the field. Guest lectures will comprise a 45-minute invited presentation about ongoing AI for drug discovery research elsewhere, followed by an instructor-led discussion about potential improvements and future directions.

Project Timeline:

8/30. Form a group (group size: TBA)

9/9. Meet with the instructor before this date to decide the project topic. The instructor will suggest readings.

10/4. Mid-term presentations: 15 minutes presentation + 5 minutes QA. This presentation needs to cover the research background, literature review, project idea, and differentiation from previous works. The presentation will be graded by professors based on the following criteria: research background (25%), literature review (25%), project idea (25%), presentation skills (15%), and Q&A session (10%).

12/2, 12/4 & 12/6. Final project presentations: 20 minutes presentation + 5 minutes QA. This presentation must cover the research background, method, results, future plans, potential pitfalls, and impact. It will be graded by professors based on the following criteria: method (30%), results (30%), future plans (10%), potential pitfalls (10%), impact (10%), presentation skills (5%), and Q&A session (5%).

12/7-12/13 Peer review of the final project report (6-8 pages). Criteria: Background and Significance (Is the problem well-defined and important?), Related work (Is the related work comprehensively reviewed?), Approach (Is the proposed method appropriate and effectively applied?), Innovation (Is this idea original and novel?), Result (Are the results valid, reliable, and significant?), Discussion (Are the impacts, strengths, limitations, and future works thoroughly discussed?) and Presentation/Demo (Is the project well-presented and the report well-written?).

Evaluation:

1. Midterm Project (Presentation): 30%
2. Final Project (Presentation): 30%
3. Final Project (Report): 40%

The students will be evaluated in **two project presentations and one final project report**. Students will be allowed to inspect their reports to verify their scores but reports will be kept by the faculty for three years. A letter grade will be assigned, with each faculty member's evaluation weighed equally.

Grading will be on a point basis with >90 (A), >87 (A-), >83 (B+), >80 (B), >77 (B-), >73 (C+), >70 (C), >67 (C-), >63 (D+), >60 (D), >57 (D-), >53 (E). ***There will be no make-up exams.***

MISCELLANEOUS:

Attendance:

Class attendance is mandatory. However, students are allowed up to 2 unexcused absences. Excused absences must be communicated to the coordinator in advance, with appropriate documentation provided (e.g., a doctor's note, an official university letter). Students are responsible for catching up on any missed work due to absences.

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu/evals. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning Technical Support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process

Note: The syllabus may be subject to minor modifications to better suit class needs and stay current with the latest advancements in the field.

Course|New for request 20422

Info

Request: PHC 6XXX Public Health Methods II: Applying Qualitative & Mixed Methods for Assessment
Description of request: Request to create new course PHC6XXX Public Health Methods II: Applying Qualitative & Mixed Methods for Assessment
Submitter: April Oneal apriloneal3@ufl.edu
Created: 8/30/2024 2:11:27 PM
Form version: 1

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
PHC

Course Level
*Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.). *
* *

Response:
6

• 1 = 1000 level Introductory undergraduate
• 2 = 2000 level Introductory undergraduate
• 3 = 3000 level Intermediate undergraduate
• 4 = 4000 level Advanced undergraduate
• 5 = 5000 level Introductory graduate/professional
• 6 = 6000 level Intermediate graduate/professional
• 7 = 7000 level Advanced graduate/professional
• 8 = 8000 level Advanced professional
• 4/5 = 4000/5000 Joint undergraduate/graduate
• 4/6 = 4000/6000 Joint undergraduate/graduate

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Committee) and require separate requests to each body*

Course Number
Enter the three-digit number indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this should be XXX until SCNS assigns an appropriate number.

Response:
XXX

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100-character limit (including spaces and punctuation) for course titles. *

Response:
Public Health Methods II: Applying Qualitative & Mixed Methods for Assessment

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
PHM II: Qual & Mixed Assessmen

Delivery Method
Indicate the primary intended delivery method for this course.

Response:
PC - Primarily Classroom (0-49% of course content taught outside of classroom)

If the course is to be offered through UF Online, please include a memo of support from the UF Online program.

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Spring

Effective Year
Select the requested year that the course will first be offered. See preceding item for further information.

Response:
2026

Rotating Topic
Select "Yes" if the course routinely has varying course titles, topics, and student learning outcomes within or between semesters. Small changes to weekly topics and or texts that do not change the course description or student learning outcomes do not need to have rotating topics designation.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion. Note that credit hours are regulated by Rule 6A-10.033, FAC. If the course will be offered with variable credit, select "Variable" and then indicate the minimum and maximum credits per section. Additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
3

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission. If S/U only, please remember that the syllabus must include a grading rubric that clearly indicates how students will earn S or U grades.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:
Regularly Scheduled

• Regularly Scheduled [base hr]
• Thesis/Dissertation Supervision [1.0 headcount hr]
• Clinical Instruction [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Course Type
*Please select the type of course being created. These categories are required by the Florida Board of Governors. *

Response:
Lecture

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course. If weekly contact hours are not 1:1 for credits (e.g. 4 contact hours per week for a 2 credit course), please explain why.

Response:
3

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 500 characters or less. See course description guidelines. Please do not start the description with "This course.."

Response:
This is the second of two courses that focus on public health/global health research and practice using both quantitative and qualitative methods. This course will introduce qualitative and mixed methods and their relevance to rigorous public health research and practice, with an emphasis on using qualitative methods to conduct needs and capacity assessments within communities and organizations.

Prerequisites
*Indicate all requirements that must be satisfied prior to enrollment in the course, or enter N/A if there are none. "Permission of department" is always an option so it should not be included in any prerequisite or co-requisite. *
*Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be written so that it can be enforced in the registration system. *
Undergraduate courses level 3000 and above must have a prerequisite.
Please verify that any prerequisite courses listed are active courses.

Response:
PHC 6XXX, Public Health Methods I: Quantitative Applications

Completing Prerequisites:

• Use "&" and "or" to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• If the course prerequisite should list a specific major and/or minor, please provide the plan code for that major/minor (e.g., undergraduate Chemistry major = CHY_BS, undergraduate Disabilities in Society minor = DIS_UMN)

*Example: *
<ol>
• Prereq published language: BSC 2010/2010L & BSC 2011/2011L & two additional Science or Math classes.

*• Prereq logic enforced for registration: BSC 2010 and BSC 2010L and BSC 2011 and BSC 2011L and (two additional Science or Math courses = any courses that are BSC 2### or greater, FAS2### or greater, BOT2### or greater, PCB2### or greater, BCH2### or greater, ZOO2### or greater, MCB 2### or greater, CHM 2### or greater, PHY 2### or greater, or STA 2### or greater).
*

Co-requisites

Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
None

Rationale for Placement in the Curriculum

Please indicate the degree level (Bachelors, Graduate, Professional) and program(s) (majors, minors, certificates) for which the course will be used. Please indicate if the course is intended for degree requirements or electives. Note: separate program-specific request are required to add a course into program curriculua.

Response:
This will be a required course for MPH students, who will typically take the course in their second semester. This course must be taken after successful completion of Public Health Methods I, which lays the foundation for data collection concepts.

Syllabus Content Requirements

<h2>Syllabus Content Requirements</h2>Please upload the syllabus for the proposed course. (Note that rotating topics courses should still submit a sample syllabus to illustrate the kind of content that will be included.) Before uploading, ensure that the syllabus contains:

• Student learning outcomes explaining what students will be able to do after successfully completing the course. These should use observable, measurable action verbs.
• Required and recommended readings for the course.
• Name of instructor(s) or planned instructor(s). If unknown, list as TBD.
• Materials and Supplies fees, if any.
• Methods by which students will be graded
• The grading scheme used in the course (e.g., what constitutes an A, an A-, etc.), along with information on current UF grading policies for assigning grade points. This may be achieved by including a link to the university grades and grading policies.
• A 15 week calendar or schedule of topics with enough detail to illustrate weekly topics, readings, and assignments (asynchronous or modular courses can arrange by modules rather than weeks).
• A statement related to class attendance, make-up exams and other work such as: "Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies."
• A statement related to accommodations for students with disabilities such as: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.
• A statement informing students of the online course evaluation process such as: "Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results."

Response:
All Items Included

University of Florida
College of Public Health and Health Professions
PHC 6XXX: Public Health Methods II:

Applications for Practice (3 credits)
Semester: Spring 2026
Delivery Format: Campus
Class Meeting Information: (Meeting days/time/room #, canvas site - TBD)

Instructor Name:
Office Location:
Phone Number:
Email Address:
Office Hours:
Teaching Assistants:
Preferred Course Communications:

Pre-Requisites: PHC 6XXX, Public Health Methods I: Quantitative Foundations

I. PURPOSE & OUTCOME

Course Overview

The second of two courses focusing on public health/global health research and practice using quantitative and qualitative methods. This course introduces qualitative and mixed methods and their relevance to rigorous public health research and practice, emphasizing using qualitative methods to conduct needs and capacity assessments within communities and organizations.

Relation to Program Outcomes

This course is associated with the following MPH core competencies as outlined by the Council on Education for Public Health (CEPH, 2021):

- D2.01: Apply epidemiological methods to settings and situations in public health practice.
- D2.02: Select quantitative and qualitative data collection methods appropriate for a given public health context.
- D2.03: Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
- D2.04: Interpret results of data analysis for public health research, policy, or practice
- D2.07: Assess population needs, assets, and capacities that affect communities' health.

Course Objectives

1. Distinguish between different types of public health assessments, including their purpose.
2. Differentiate between quantitative and qualitative paradigms.
3. Compare popular qualitative data analysis methods.
4. Select an approach, data collection methods, and data analysis to appropriately assess the needs, assets, and capacities that affect the health of a community.
5. Using an existing dataset, analyze qualitative data.
6. Interpret qualitative data analysis results.
7. Write a professional summary of the methods, results, and interpretation of a scientific investigation.

8. Identify appropriate dissemination methods to communicate assessment findings to stakeholders.
9. Define mixed methods research/evaluation.
10. Distinguish mixed methods from mixed modalities.
11. Discuss different social, political, and economic influences that can be encountered while developing a needs assessment.
12. List action items that researchers must take to protect human subjects during the data collection and recruitment process.
13. Critically evaluate the strengths and limitations of applied assessment studies.

Alignment of Course Objectives, Content, and Assessment

Objective	Module for Instruction of Content	Assessment Method(s)
1. Distinguish between different types of PH assessments, including purpose	3,4,5,6	• Exams 1 & 2 • Group project
2. Differentiate between qualitative and quantitative research paradigms	1	• Exam 1
3. Compare popular qualitative data analysis methods	10, 11	• Exam 3 • Group project
4. Select an approach, data collection methods, and data analysis to appropriately assess the needs, assets, and capacities of a community	7, 8, 9, 10, 11, 12, 14 (emphasis throughout)	• Exams 2 & 3 • Group project
5. Using an existing dataset, analyze qualitative data	12	• Assignment 5
6. Interpret qualitative data analysis results	13	• Assignment 5 • Exam 3
7. Write a professional summary of the methods, results, and interpretation of a scientific investigation.	15	• Assignment 1 • Assignment 6
8. Identify appropriate dissemination methods to communicate assessment findings to stakeholders.	15	• Exam 3 • Group project
9. Define mixed methods research/evaluation.	2, 14	• Exam 1
10. Distinguish mixed methods from mixed modalities	2, 14	• Exams 1 & 3 • Group Project

11. Discuss different social, political, and economic influences that can be encountered while developing a needs assessment.	6	• Exam 2 • Group project
12. List action items that researchers must take to protect human subjects during the data collection and recruitment process.	9	• Assignment 3 • Quiz 2
13. Critically evaluate the strengths and limitations of applied assessment studies.	14 (theme throughout)	• Assignment 1 • Assignment 6

Blended Learning

What is blended learning and why is it important?
A Blended Learning class uses a mixture of technology and face-to-face instruction to help you maximize your learning. Knowledge content that, as the instructor, I would have traditionally presented during a live class lecture is instead provided online before the live class takes place. This lets me focus my face-to-face teaching on course activities designed to help you strengthen higher order thinking skills such as critical thinking, problem solving, and collaboration. Competency in these skills is critical for today's health professional.

What is expected of you?
You are expected to actively engage in the course throughout the semester. You must come to class prepared by completing all out-of-class assignments. This preparation gives you the knowledge or practice needed to engage in higher levels of learning during the live class sessions. If you are not prepared for the face-to-face sessions, you may struggle to keep pace with the activities occurring in the live sessions, and it is unlikely that you will reach the higher learning goals of the course. Similarly, you are expected to actively participate in the live class. Your participation fosters a rich course experience for you and your peers that facilitates overall mastery of the course objectives.

II. DESCRIPTION OF COURSE CONTENT, FORMAT, & ACCESS

Topical Outline/Course Schedule

Week/ Dates		READINGS	Assignments Due
1	**Course Overview** **Qualitative & Quantitative Research Paradigms** -overview of differences between qualitative and quantitative research -define key assumptions of each type of paradigm	• Padgett Chapter 1, *Introduction* • Padgett Chapter 2, *Choosing the right qualitative approach* • OPTIONAL: Atieno (2009). An analysis of the strengths and limitations of qualitative and quantitative research paradigms. *Problems of Education in the 21st Century, 13*.	Syllabus Quiz Peer Introductions Module 1 Practice Quiz
2	**Mixed Methods Designs** -define mixed methods research and evaluation -distinguish mixed methods from mixed modalities	• Padgett Chapter 3, *Mixed Methods* • Fetters et al. (2013). Achieving integration in mixed methods designs—Principles and practices. *Health Services Research, 48*(6 pt 2), 2134-2156.	Module 2 Practice Quiz

3	**Introduction to Public Health Assessments** -brief overview of PH assessments -assessment versus surveillance -strengths-based versus needs-based approaches in assessment -role of social justice frameworks	• CDC (2016). *Different types of health assessments.* https://www.cdc.gov/healthyplaces/types_health_assessments.htm • Aschengrau, *Essentials of Epidemiology in Public Health*, Chapter 14: Critical review of epidemiological studies	Module 3 Practice Quiz
4	**Introduction to Public Health Assessments: Impact & Policy Assessments** -Health Impact Assessment -Policy Impact Assessment	• CDC Office of Policy, Performance, and Evaluation. Policy Analysis • Walt et al. (2008). 'Doing' health policy analysis: Methodological and conceptual reflections and challenges. *Health Policy Planning, 23*. 10.1093/heapol/czn024 • Buse et al. (2018). Towards environmental health equity in health impact assessment: innovations and opportunities. *International Journal of Public Health, 64*: 15-26. • Sohn et al. (2018). Avenues of influence: The relationship between health impact assessment and determinants of health and health equity. *Journal of Urban Health, 95*: 754-764.	Module 4 Practice Quiz
5	**Introduction to Public Health Assessments: Environment Assessments** -Environmental impact assessment -Human health risk assessment -Public health assessment -Microbial risk assessment		Module 5 Practice Quiz Assignment 1: Critique a quantitative assessment or surveillance paper.
6	**Introduction to Public Health Assessment: Community & Needs Assessments** -Community health assessment -Community health needs assessment -Rapid community assessment -Assessing needs and assets **Needs Assessments: Sociopolitical and Economic Considerations** -discuss social, political, and economic influences that can be encountered when developing a needs assessment	• Grant et al. (2015). Community health needs assessment: A pathway to the future and a vision for leaders. *The Health Care Manager, 34*(2), p. 147-156. • Cain et al. (2016) The power of community voices for enhancing community health needs assessments. Health Promotion Practice, 18(3). • Soriano (2013). Chapter 2: Sociopolitical and economic considerations. In *Conducting needs assessments: A multidisciplinary approach.* Sage. • Moran Jackson et al. (2018). Using the transformative paradigm to conduct a mixed methods needs assessment of a marginalized community: Methodological lessons and implications. *Evaluation and Program Planning, 66*, p. 111-119.	Module 6 Practice Quiz Exam 1 (Modules 1-5)
7	**Needs Assessments: Integrating Reviews** -overview of literature reviews -introduce systematic reviews and meta-analyses -discuss role of reviews within the needs assessment process	• UF Library resources. https://guides.uflib.ufl.edu/SR/Types • Nelson (2014). Systematic reviews. In *Systematic Reviews to Answer Health Care Questions.* Lippincott Williams & Wilkins. • Ravghi et al. (2023). A scoping review of community health needs and assets assessment: Concepts, rationale, tools and uses. *BMC Heath Serv Res, 23*(1), 44.	Module 7 Practice Quiz Assignment 2: Critique of Written Public Health Assessment Report In-class activity (ICA): Meet with your group; prepare for Part 1 of group project

8	**Design & Alignment in PH Assessments** -discuss how to select an approach and align it with data collection methods and analysis to appropriately assess needs/assets/capacities of community	• Padgett Chapter 4, *Getting Started: Study Design & Sampling* • Heitner K. L., & Sherman K. C. (2014). Chapter 8: Aligning the Problem, Research Objectives, Research Questions, and Research Design. In *Dissertation Field Guide.*	Module 8 Practice Quiz Part 1 of Group Project
9	**Ethical Considerations** -actions researchers must take to protect human subjects during the data collection and recruitment process -focus on ethics as they relate to qualitative research	• Padgett Chapter 5, *Ethical Issues in Qualitative Research* • Glesne, C. (2011). Chapter 6: But is it ethical? Considering what is "right." In *Becoming qualitative researchers: An introduction* (4th ed.) (pp. 162-183). Boston, MA: Pearson.	Module 9 Practice Quiz ICA, Assignment 3: Ethical Scenarios in Qualitative Research
10	**Qualitative Data: Data Collection Methods, Part 1** -Overview -Focus Groups -Interviews -Developing protocols -focus on how to choose appropriate data collection methods given research or evaluation question	• Padget Chapter 7, *Interviewing & Use of Documents*	Module 10 Practice Quiz ICA, Assignment 4: Developing an Interview Guide
11	**Qualitative Data: Data Collection Methods, Part 2** -Observations -focus on how to choose appropriate data collection methods given research question **Qualitative Data Collection in Practice**	• Padget Chapter 6, *Entering the Field & Conducting Observations*	Module 11 Practice Quiz ICA: Conduct Interviews ICA: Meet with your group; prepare for Part 2 of group project
12	**Qualitative Data Analysis & Interpretation** -Transcription -Data analysis methods & software -Braun & Clarke's 6 steps for thematic analysis **Qualitative Data Analysis in Practice** -developing codes and themes	• Padgett Chapter 8, *Data Analysis & Interpretation* • Neergaard et al. (2009) Qualitative description – the poor cousin of health research? *BMC Medical Research Methodology, 9*(52). • Bryne (2022). A worked example of Braun and Clarke's approach to reflexive thematic analysis. *Quality & Quantity, 56*, 1391-1412. • Linneberg & Korsgaard. (2019). Coding qualitative data: A synthesis guiding the novice. *Qualitative Research Journal.* • Hamilton et al. (2023). Exploring the Use of AI in Qualitative Analysis: A Comparative Study of Guaranteed Income Data. International Journal of Qualitative Methods, 22.	Module 12 Practice Quiz Exam 2 (Modules 6-11) Part 2 of Group Project
13	**Interpretation of Findings** -Qualitative findings -Integrating mixed method findings **Qualitative Data Interpretation in Practice**	• Padgett Chapter 8, *Data Analysis & Interpretation* • Patton (1999). Enhancing the quality and credibility of qualitative analysis. *Health Services Research.*	Module 13 Practice Quiz Assignment 5: Qualitative Analysis & Interpretation ICA: Meet with your group; prepare for Part 3 of group project
14	**Addressing Rigor in Qualitative and Mixed Method Designs**	• Padgett Chapter 9, *Strategies for Rigor* • Johnson et al. (2017). Pillar integration process: A joint display technique to integrate data in mixed methods research. *Journal of Mixed Methods Research, 13* (3). https://doi.org/10.1177/155868981774	Module 14 Practice Quiz Part 3 of Group Project ICA: Identify and meet with your partner for Assignment 6.

15	**Report Writing** -focus on skillset for writing summaries of methods/results/interpretation of scientific investigation -emphasis on reporting for assessments -writing briefs **Dissemination Methods** -identify appropriate dissemination methods to communicate assessment findings to stakeholders -introduction to variety of communication methods; emphasis on needs of community and cultural concordance	• Padgett Chapter 10, *Telling the Story: Writing up the qualitative study.* • O'Brien et al. (2014). Standards for Reporting Qualitative Research. *Academic Medicine, 89*(9), 1245-251.	Module 15 Practice Quiz Assignment 6: Comparison of Methodological Differences
	FINAL REPORT DUE Monday of Final Exam week **Final Exam Deadline as noted by UF**		Final Group Project Due Exam 3 (Modules 12-15)

*Readings may change during the course of the semester. Check Canvas for the list of required readings for each module.

Course Materials & Technology
This course will use the Canvas CMS. If you experience technical difficulties, please contact the UF Help Desk (learning-support@ufl.edu; 352-392-HELP – select option 2).

UF Internet (eduroam) is available at thousands of locations worldwide!
UF students can access eduroam (highspeed WiFi) for free with their GatorLink log-in credentials. The eduroam network is fast and secure and has more than 10,000 wi-fi hotspots in 106 countries and territories worldwide. Many of these locations are in open spaces and/or large communal rooms, so you can get online while physically distancing and following CDC guidelines in an air-conditioned space. Access is available in rural areas, too! Here's a link to all the eduroam sites.

Required Textbook: Padgett, D. K. (2012). *Qualitative and Mixed Methods in Public Health.* Sage Publications.

Additional Required Readings: Posted within each module on the course website.

Additional Academic Resources (see Section V for additional student services)
- Career Connections Center: Reitz Union 1300, 352-392-1601. Career assistance and counseling services.
- Library Support: Receive assistance in using the libraries or finding resources.
- Teaching Center: General study skills and tutoring
  1317 Turlington Hall, 352-392-2010; or, to make a tutoring appointment: 352-392-6420.
- Writing Studio*:* Help with brainstorming, formatting, and writing papers. 2215 Turlington Hall, 352-846-1138.
- Student Complaints On-Campus: Visit the Student Honor Code & Student Conduct Code page for more info.
  On-Line Students Complaints: View the Distance Learning Student Complaint Process.

III. Academic Requirements & Grading

ASSIGNMENTS	Points
Syllabus Quiz	0
Peer Introduction Discussion Post	1
Assignments (6 total at 4-6 pts each)	30

Exams (3 total at 8 pts each)	24
Group Project	30
Group & Self-Assessment	1
Module Self-Check (15 at 1 point each; lowest dropped)	14
Total	100

Grading Scale

Points	93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	62-60	Below 60
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Grade Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	.67	0

Please be aware grades of C- (or below) are not acceptable for graduate students. Graduate students' GPA must be at least 3.0 in all graduate courses (≥5000 level). A grade of C will count toward the graduate degree only there are sufficient credits in graduate courses been earned with a B+ or higher.

Information on current UF grading policies can be found at: https://catalog.ufl.edu/graduate/regulations/

Description of Graded Course Assignments

- **Syllabus Quiz:** Students are asked to complete a brief quiz on the syllabus prior to unlocking the course content on Canvas. **NOTE:** While this quiz is ungraded, students must receive a 100% to unlock course materials. Students will NOT be able to access course materials without passing the quiz.
- **Peer Introduction – Canvas Discussion (1 point):** Students will post a brief introduction of themselves and their interests to this Canvas Discussion board. This assignment is due at the end of Week 1 and must be completed before moving onto Week 2 content. Check Canvas for details.
- **Assignment 1 – Critique of a surveillance or assessment paper (5 pts):** Students will select from a list of provided quantitative-focused peer-reviewed articles. They will then write a 2-page paper discussing the strengths and limitations of that study. This assignment should be 2-pages (typed, 1-inch margins, 10- to 12-point serif font, double spaced). Students are required to follow the guidelines outlined in the assignment guidelines (posted to Canvas).
- **Assignment 5 – Critique of Written Report of a Public Health Assessment (5 pts):** Students will select from a short list of articles that that discuss the mixed methods or mixed modes process or findings of a needs assessment. They will then provide a brief summary of the needs assessment, including its purpose, methods, and results, an interpretation of whether the author took a strengths-based approach, and a discussion of how social, political, or economic factors were accounted for. This assignment should be 2-pages (typed, 1-inch margins, 10- to 12-point serif font, double spaced). Students are required to follow the guidelines outlined in the assignment guidelines (posted to Canvas).
- **Assignment 3 – Ethical Scenarios in Qualitative Research (5 pts):** Students will work in small discussion groups and respond to three ethical scenario prompts related to mixed methods or qualitative research. These scenarios will focus on qualitative data collection and recruitment. Submit this assignment via the Canvas Discussions assignment (4-pts). Each student must respond to at least one group's post (1-pt). Students are required to follow the guidelines outlined in the assignment guidelines (posted to Canvas).

- **Assignment 4 – Interview Guide (4 pts):** Working individually or in groups of 2-3, and using guidance from in-class materials, students will create a qualitative interview guide/protocol. Details on how to select the population and topic of interest are outlined in Canvas. This assignment is submitted via Canvas. Once submitted, you will receive feedback that you are expected to incorporate before conducting the interviews as part of an in-class activity.
- **Assignment 5 – Qualitative Analysis (5 pts):** Students will use a designated qualitative interview or focus group transcript. Students are to independently code the interview using thematic analysis. Students will then submit the coded transcript, list of codes, themes, and subthemes with operational definitions, and a 1-2 page written reflection on the data analysis process. Students are required to follow the guidelines outlined in the assignment (posted to Canvas).
- **Assignment 6** – **Comparison and Reflection of methodological differences (6 pts):** Using the two articles reviewed as part of Assignment 1 & 5 as their basis, students will create a 5-10 minute video recording their observations on the differences between public health assessments and practices that are quantitative-focused, quantitative-focused, or mixed methods or mixed modes focused. Students are encouraged to work in pairs, selecting a peer who chose at least one different article for prior assignments. This is to allow for a richer discussion of differences across the observed studies. In this video, students are expected to address considerations for rigor. Specific requirements are outlined on Canvas.
- **Exams (24 pts)**: There will be 3 exams total. Exams are administered via Canvas using Lockdown Browser. Although the exams are taken outside of class and could thus be considered open-book, the exams are timed and require synthesis of course material. You will not have time to "look-up" answers. Exams include a mix of multiple-choice and short essay questions. While exams focus on the course content covered since the previous exam, you are responsible for any course material presented earlier as well.
  Each exam is worth 8 points each.
- **Group Project (27 pts)**: Students will work in groups to compose a proposal for a mixed methods of qualitative public health assessment. Early in the semester, students will be assigned groups based on your public health areas of interest. The assignment will be submitted in stages:
    - **Part 1:** This portion will include the research question, type of public health assessment, approach to conducting the assessment, and a rationale for choices. (3 pts)
    - **Part 2:** This portion will include the research design and data collection methods along with supporting rationale, as well as sociopolitical, economic, and ethical considerations. (3 pts)
    - **Part 3:** This portion will include the data analysis plan with rationale and attention to trustworthiness. (3 pts)
    - **Final written report**: The final written report will include parts 1-3 **with edits** and an additional section on the dissemination plan with supporting rationale. (21 pts)
- **Module Self-Check (14 points)**: At the end of each of the 154 modules, students will complete a knowledge self-check in the form of a closed-response quiz assessment. Each module self-check is valued at 1-point. Students will have two opportunities to complete the self-check with automatic feedback provided after each. The lowest module self-check quiz will be dropped at the end of the semester.

IV. CLASS POLICIES

Assignment Policy: Be sure to review assignment descriptions in the course syllabus and in Canvas, and take note of any additional in-class guidance that is given for each assignment. Please note that important and helpful information about your assignments will be provided in class. Students are expected to do their best work and to turn in work on time. Some deadlines are self-imposed and will be determined by the specific assignment.

- Unless otherwise noted, assignments are due at 11:57pm on the date indicated. A grace period is given until 1AM the next day, in which the assignment will not be counted as late.
- Please make efforts to turn assignments in early. **Make back-up copies of all your work**, as some assignments may not be returned and Canvas access may expire after the semester ends. All written work must be typed, unless otherwise indicated. Submitting the incorrect document will not be accepted as an excuse for late or missing work.
    - *Some assignments will not be accepted late. Others are subject to a 10% deduction in grade for every day it is late.* (Check assignment details in Canvas.)
    - I do recognize that personal circumstances arise (life happens) that may interfere with your ability to meet a deadline. If these unanticipated events do occur, please let me know as soon as possible. I will not be receptive to retrospective requests for extensions without a compelling and evidenced rationale.

Attendance Policy: Class attendance is part of the Professionalism component of this course. You are expected to notify the instructor, in advance, when you know you will need to miss, be late to, or leave early from class. If you have an unexpected absence that causes you to miss an in-class activity or discussion, you must reach out to the instructor within 48-hours of the absence (and provide documentation) to receive instructions for make-up work.
Excused absences must be consistent with university policies in the Graduate Catalog (https://catalog.ufl.edu/graduate/regulations/#text). Additional information can be found here: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Electronics Policy: Please bring your laptop of tablet to every class period. Laptops and other electronics should only be used when appropriate for taking notes and/or completing in-class activities. As noted under the Professionalism assignment, professionalism points may also be deducted for browsing the internet (unless part of a class activity), texting, or any other behaviors that are disruptive to your instructor or peers.

Extra Credit Policy: There is no extra credit and there are no extra credit assignments. Additionally, no points will be "given" at the end of the semester. University Policy: Asking for extra points after your course is completed is an **HONOR OFFENSE.**

Inclusive Learning Environment: Public health and health professions are based on the belief in human dignity and on respect for the individual. As we share our personal beliefs inside or outside of the classroom, it is always with the understanding that we value and respect diversity of background, experience, and opinion, where every individual feels valued. We believe in, and promote, openness and tolerance of differences in ethnicity and culture, and we respect differing personal, spiritual, religious and political values. We further believe that celebrating such diversity enriches the quality of the educational experiences we provide our students and enhances our own personal and professional relationships. We embrace The University of Florida's Non-Discrimination Policy, which reads, "The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act." If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see your instructor or refer to the Office of Multicultural & Diversity Affairs website.

Make-up Policy: If a student fails to submit either a **quiz, exam,** or **assignment on-time**, they will be provided an opportunity to submit after the deadline provided they have an acceptable reason for missing the deadline. Decisions to allow students to make-up requirements after their deadline will be made by the course instructor after consulting the university-wide attendance policies specified in the UF Graduate Catalog.

Netiquette, Communication Courtesy: All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. I expect that students will show respect to their peers and instructor in all online communications. I will not tolerate improper language and disparaging comments; these actions will result in disciplinary action. Review this resource for information on the expected behavior of students when communicating with peers and instructors online.

Title IX: University of Florida has zero tolerance for sexual discrimination, harassment, assault/battery, dating violence, domestic violence, or stalking. Students are encouraged to report any experienced or witnessed occurrences to law enforcement and/or one of UF's Title IX Coordinators. Students can report incidents or learn more about their rights and options here. Or contact Student Conduct and Conflict Resolution at 202 Peabody Hall, 352-392-1261.

V. STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

To ensure that we have a great semester, remember --
All transactions and relationships are enriched by courtesy:
Be considerate of one another during group work. All ideas have merit.
Be considerate of your classmates and the professor during class meetings by being attentive, power-off technology, and be prepared to fully participate in each class.

Academic & Personal Integrity: I expect and assume that you will be honest with me in all aspects of your conduct regarding our course. In return, I will do the same with you. By formally registering for coursework at the University of Florida, you are bound by the Honor Pledge which states:

> *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code."* On all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. Violations of the Honor Code will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action.

Faculty Course Evaluation Process: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Professionalism: Your active and thoughtful participation in class activities and collaborative discussions is necessary for this course. Thus, you are expected to come to each class adequately prepared and ready for active engagement. You are also expected to submit assignments that are professionally formatted and free from grammar or spelling errors. Failure to do so could affect your grade.

VI. SUPPORT SERVICES

Accommodations for Students with Disabilities or Different Abilities: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protections for persons with disabilities. Among other things, it requires that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability (or different-ability) that affects your learning, please reach out to the Disabilities Resource Center (DRC). And then share your accommodation letter with your instructor as quickly as possible to ensure you have access for the full semester.

If you did not register formally, but you know you have different learning, behavioral, or other needs that may affect your performance in the course, tell me and I will help you.

Counseling and Student Health
Students sometimes experience stress from academic expectations and/or personal and interpersonal issues that may interfere with their academic performance. If you find yourself facing issues that have the potential to, or are already, negatively affecting your coursework, please talk with an instructor and/or seek help through University resources available to you.

- Counseling and Wellness Center: Individual counseling, group counseling, and online resources are available to UF students at no charge. Also psychological assessment, intervention, and assistance for math and test anxiety. Visit the website or call 352-392-1575. If you are having a crisis, you can call anytime and ank to speak to the counselor on call.
- GatorWell Health Promotion services: GatorWell provides health-related resources, information, and individual services to students. Recommended services: Wellness Coaching for Academic Success (virtual appointments available).
- The Student Health Care Center , 352-392-0627, at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services. The clinic is located on the second floor of the Dental Tower in the Health Science Center.
- UMatter, We Care: Available for students who are experiencing personal life disruptions that may affect their academics. UMatter can help you identify resources and communicate with instructors on your behalf. 352-294-CARE (2273), umatter@ufl.edu
- University Police Department: Visit their website or call 352-392-1111 (or 9-1-1 for emergencies).
- Alachua County Crisis Center: Visit the website or call the hotline - 352-264-6789
- Meridian Behavioral Healthcare, 352-374-5600
- **UF Health Shands Emergency Room / Trauma Center:** For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

Do not wait until you reach a crisis to come in and talk with your instructor. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.